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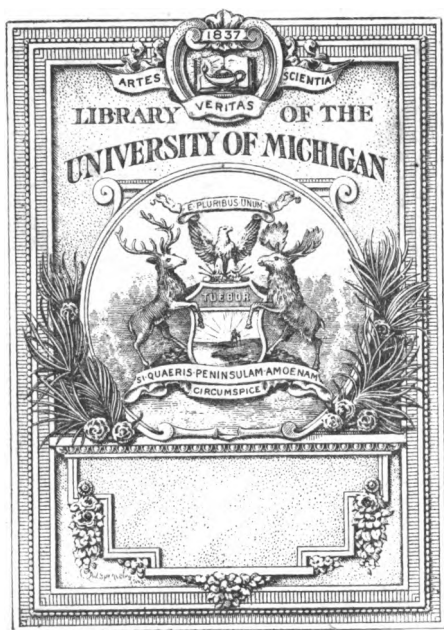
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CALENDAR
OF THE
UNIVERSITY OF MICHIGAN



1913-1914

Ann Arbor
PUBLISHED BY THE REGENTS
1914

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ANNOUNCEMENTS

1913-1914 and 1914-1915

1913

- June 30-August 22. Summer Session in the Departments of Literature, Science, and the Arts, and of Engineering, and the School of Pharmacy.
June 30-August 8. Summer Session in the Medical Departments.
June 23-August 29. Summer Session in the Department of Law.
September 30. FIRST SEMESTER BEGINS IN ALL DEPARTMENTS OF THE UNIVERSITY.
November 27. Holiday, Thanksgiving Day.
December 19. (Evening) Holiday Vacation begins.

1914

- January 6. (Morning) Exercises resumed.
February 6. (Evening) FIRST SEMESTER CLOSES.
February 5-7. *Examinations for Admission to all Departments.*
February 9. SECOND SEMESTER BEGINS.
February 22. Holiday, Washington's Birthday.
April 3. (Evening) Recess begins, ending April 13 (evening).
May 30. Holiday, Memorial Day.
June 21. *Baccalaureate Address.*
June 22-23. *Class Day Exercises in the several Departments.*
June 24. *Alumni Day.*
June 25. COMMENCEMENT. The Commencement Oration is to be delivered by Edmund Janes James, Ph.D., LL.D., President of the University of Illinois.
June 29-August 21. Summer Session in the Departments of Literature, Science, and the Arts, and of Engineering, and Architecture, the School of Pharmacy, and the Graduate Department.
June 29-August 7. Summer Session in the Medical Departments.
June 22-August 28. Summer Session in the Department of Law.
September 22-26. *Examinations for Admission to all Departments of the University.*
September 29. FIRST SEMESTER BEGINS IN ALL DEPARTMENTS OF THE UNIVERSITY.
November 26. Holiday, Thanksgiving Day.
December 22. (Evening) Holiday Vacation begins.

1915

January 5.	(Morning) Exercises resumed.
February 5.	(Evening) FIRST SEMESTER CLOSES.
February 4-6.	<i>Examinations for Admission to all Departments.</i>
February 8.	SECOND SEMESTER BEGINS.
February 22.	Holiday, Washington's Birthday.
April 9.	(Evening) Recess begins, ending April 19 (evening).
May 30.	Holiday, Memorial Day.
June 24.	COMMENCEMENT.
June 28.	Summer Session begins in all Departments (Except Law).
Sept. 28-October 2.	<i>Examinations for Admission to all Departments.</i>
October 5.	FIRST SEMESTER BEGINS IN ALL DEPARTMENTS.

1914

1915

JANUARY							JULY						
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** Died July, 1913.

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- ALBION WALTER HEWLETT, B.S., M.D., *Professor of Internal Medicine, and Director of the Clinical Laboratory in the Department of Medicine and Surgery.*
1835 Cambridge Road.
- KARL EUGEN GUTHE, Ph.D., *Professor of Physics, and Dean of the Graduate Department.*
725 Cambridge Road.
- JESSE SIDDALL REEVES, Ph.D., *Professor of Political Science.*
902 Baldwin Avenue.
- EARLE WILBUR DOW, A.B., *Professor of European History.*
554 Thompson Street.
- WALTER BOWERS PILLSBURY, Ph.D., *Professor of Psychology and Director of the Psychological Laboratory.*
714 South State Street.
- ALVISO BURDETT STEVENS, Ph.C., Ph.D., *Professor of Pharmacy, and Acting Dean of the School of Pharmacy.*
1124 Hill Street.
- EVANS HOLBROOK, A.B., LL.B., *Professor of Law.*
719 East University Avenue.
- CLARENCE THOMAS JOHNSTON, C.E., *Professor of Geodesy and Surveying, and Director of the Bogardus Engineering Camp.*
1430 Hill Street.
- ULRICH BONNELL PHILLIPS, Ph.D., *Professor of American History.*
711 Cambridge Road.
- LOUIS A. STRAUSS, Ph.D., *Professor of English.*
1601 Cambridge Road.

- ALFRED HOLMES WHITE, A.B., B.S., *Professor of Chemical Engineering.*
715 Church Street.
- ARTHUR LYON CROSS, Ph.D., *Professor of European History.*
705 South State Street.
- EDWARD RAYMOND TURNER, Ph.D., *Professor of European History.*
734 South Ingalls Street.
- HENRY ARTHUR SANDERS, Ph.D., *Professor of Latin.*
1820 Hill Street.
- JAMES WATERMAN GLOVER, Ph.D., *Professor of Mathematics and Insurance.*
620 Oxford Road.
- HENRY EARLE RIGGS, A.B., C.E., *Professor of Civil Engineering.*
1319 Cambridge Road.
- EWALD AUGUSTUS BOUCKE, Ph.D., *Professor of German.*
901 Oakland Avenue.
- HORACE WILLIAMS KING, B.S., *Professor of Hydraulic Engineering.*
1207 Oakland Avenue.
- JOHN ROBERT EFFINGER, Ph.D., *Professor of French, and Acting Dean of the Department of Literature, Science, and the Arts.*
1035 Martin Place.
- HENRY CLAY ANDERSON, B.M.E., *Professor of Mechanical Engineering.*
904 Lincoln Avenue.
- CAMPBELL BONNER, Ph.D., *Professor of the Greek Language and Literature.*
1803 Hill Street.
- JOHN STRONG PERRY TATLOCK, Ph.D., *Professor of English.*
716 Cambridge Road.
- ERMINE COWLES CASE, Ph.D., *Professor of Historical Geology and Paleontology, and Curator of the Paleontological Collection.*
1609 South University Avenue.
- STANISLAUS JAN ZOWSKI (ZWIERZCHOWSKI), Dipl. Ing., *Professor of Mechanical Engineering.*
2006 Washtenaw Avenue.
- WILLIS GORDON STONER, A.B., LL.B., *Professor of Law.*
1004 East University Avenue.
- RALPH WILLIAM AIGLER, LL.B., *Professor of Law.*
1404 Cambridge Road.
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- JOHN BARKER WAITE, A.B., LL.B., *Professor of Law.* 819 South State Street.
- LEWIS MERRITT GRAM, B.S., *Professor of Structural Engineering.* 912 Oakland Avenue.
- LOUIS HOLMES BOYNTON, *Professor of Architecture.* 1002 Cornwell Place.
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- CLARENCE LINTON MEADER, Ph.D., *Professor of Latin, Sanskrit, and General Linguistics.* 1941 Geddes Avenue.
- EDGAR NOBLE DUFEE, A.B., *Professor of Law.* 908 Church Street.
- UDO JULIUS WILE, A.B., M.D., *Professor of Dermatology and Syphilology.* 1919 Geddes Avenue.
- CLAUDE ADELBERT BURRETT, Ph.B., M.D., *Professor of Dermatology, Genito-Urinary Diseases and Electrotherapeutics, and Registrar of the Homoeopathic Medical College.* 1020 Cambridge Road.
- DAVID FRIDAY, A.B., *Professor of Political Economy.* 1203 Forest Avenue.
- TOBIAS J. C. DIEKHOFF, Ph.D., *Junior Professor of German.* 1030 Oakland Avenue.
- CYRENUS GARRITT DARLING, M.D., *Clinical Professor of Surgery and Demonstrator of Surgery in the Department of Medicine and Surgery, and Clinical Professor of Oral Surgery in the College of Dental Surgery.* 718 Forest Avenue.
- CARL DUDLEY CAMP, M.D., *Clinical Professor of the Diseases of the Nervous System in the Department of Medicine and Surgery.* 927 Cornwall Place.
- DAVID MURRAY COWIE, M.D., *Clinical Professor of Pediatrics and Internal Medicine in the Department of Medicine and Surgery.* 608 East Jefferson Street.

- WILLIAM HENRY WAIT, Ph.D., *Junior Professor of Modern Languages.* 1706 Cambridge Road.
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- †HUGO PAUL THIEME, Ph.D., *Junior Professor of French.*
- HARRISON McALLISTER RANDALL, Ph.D., *Junior Professor of Physics.* 1208 Prospect Street.
- WALTER BURTON FORD, Ph.D., *Junior Professor of Mathematics.* 904 Forest Avenue.
- RALPH HAMILTON CURTISS, Ph.D., *Junior Professor of Astronomy, and Assistant Director of the Observatory.* The Observatory.
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- MORRIS PALMER TILLEY, Ph.D., *Junior Professor of English.* 1015 Ferdon Road.
- ARTHUR WHITMORE SMITH, Ph.D., *Junior Professor of Physics.* 1008 Oakland Avenue.
- WILLIAM D. HENDERSON, Ph.D., *Junior Professor of Physics, and Director of the University Extension Service.* 1001 Forest Avenue.
- OTTO CHARLES GLASER, Ph.D., *Junior Professor of Zoology.* 1827 Hill Street.

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1332 Forest Court.
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605 Oswego Street.
- PETER FIELD, Ph.D., *Junior Professor of Mathematics.*
1054 Ferdon Road.
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548 Thompson Street.
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1019 Michigan Avenue.
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1331 Washtenaw Avenue.
- HOWARD B. MERRICK, C.E., *Assistant Professor of Surveying.*
930 Church Street.
- MYRA BEACH JORDAN, A.B., *Dean of Women.*
923 Olivia Avenue.
- DAVID MARTIN LICHTY, Ph.D., *Assistant Professor of General Chemistry.*
922 Olivia Avenue.
- WARREN WASHBURN FLORER, Ph.D., *Assistant Professor of German.*
910 Olivia Avenue.

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- CARL EDGAR EGGERT, Ph.D., *Assistant Professor of German.* 912 Forest Avenue.
- WILLIAM JAY HALE, Ph.D., *Assistant Professor of General Chemistry.* 633 Church Street.
- CHARLES SCOTT BERRY, Ph.D., *Assistant Professor of Education.* 618 Church Street.
- JAMES PYPER BIRD, A.B., *Assistant Professor of French and Spanish, and Secretary of the Faculty of the Departments of Engineering and Architecture.* 711 Twelfth Street.
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- HENRY ALLEN GLEASON, Ph.D., *Assistant Professor of Botany, Curator of the Phanerogamic Herbarium, and Acting Director of the Biological Station.* 1216 South University Avenue.
- ALBERT ROBINSON CRITTENDEN, Ph.D., *Assistant Professor of Latin.* 1031 Forest Avenue.
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- WILLIAM GABB SMEATON, A.B., *Assistant Professor of General Chemistry.* 605 Oxford Road.
- LEE HOLT CONE, Ph.D., *Assistant Professor of Organic Chemistry.* 521 Monroe Street.
- RUSSELL WELFORD BUNTING, D.D.Sc., *Assistant Professor of Dental Pathology and Histology.* 916 Church Street.
- FREDERICK STEPHEN BREED, Ph.D., *Assistant Professor of Education.* 1414 Washtenaw Avenue.
- ROBERT WILHELM HEGNER, Ph.D., *Assistant Professor of Zoology.* 1430 Hill Street.

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WALTER TURNER FISHLEIGH, A.B., B.S., *Assistant Professor of Engineering Mechanics.* 952 Greenwood Avenue.

JOHN EDWARD EMSWILER, M.E., *Assistant Professor of Mechanical Engineering.* 1009 Church Street.

JOHN R. BRUMM, A.M., *Assistant Professor of Rhetoric, and University News Editor.* 1916 Cambridge Road.

CALVIN HENRY KAUFFMAN, Ph.D., *Assistant Professor of Botany, and Curator of the Cryptogamic Herbarium.* 1326 Prospect Street.

CATHERINE LEIGHTON BIGELOW, *Director of the Barbours Gymnasium.* 1004 Oakland Avenue.

ALEXANDER GRANT RUTHVEN, Ph.D., *Assistant Professor of Zoology and Director of the Museum of Zoology.* 1110 Oakland Avenue.

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JOHN FREDERICK SHEPARD, Ph.D., *Assistant Professor of Psychology.* 908 Oakland Avenue.

HOBART HURD WILLARD, Ph.D., *Assistant Professor of Analytical Chemistry.* 802 Monroe Street.

BEVERLEY ROBINSON, B.S., *Assistant Professor of Architecture.* 1345 Wilmot Street.

JOHN WILLIAM SCHOLL, Ph.D., *Assistant Professor of German.* 917 Forest Avenue.

WALTER FRED HUNT, A.M., *Assistant Professor of Mineralogy.* 1030 Baldwin Avenue.

NEIL HOOKER WILLIAMS, Ph.D., *Assistant Professor of Physics.* 1020 Olivia Avenue.

RICHARD DENNIS TEALL HOLLISTER, A.M., *Assistant Professor of Oratory.* 1306 Wells Street.

HARRY HURD ATWELL, B.S., *Assistant Professor of Surveying.* 2305 Geddes Avenue.

†SAMUEL COLVILLE LIND, Ph.D., *Assistant Professor of General and Physical Chemistry.*

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- CHARLES BRUCE VIBBERT, A.B., *Assistant Professor of Philosophy.*
819 South State Street.
- HENRI THEODORE ANTOINE DE LENG HUS, Ph.D.,
Assistant Professor of Botany. 722 Arbor Street.
- ELMER EDWIN WARE, B.S., *Assistant Professor of Chemical Engineering.*
808 Packard Street.
- ALFRED OUGHTON LEE, M.D., *Assistant Professor of Modern Languages.*
904 Church Street.
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708 South University Avenue.
- AARON FRANKLIN SHULL, Ph.D., *Assistant Professor of Zoology.*
935 Greenwood Avenue.
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- PARISH STORRS LOVEJOY, *Assistant Professor of Forestry.*
717 Cambridge Road.
- CHARLES HORACE FESSENDEN, M.E., *Assistant Professor of Mechanical Engineering*
721 South Ingalls Street.
- HARRY GEORGE RASCHBACHER, B.S. (C.E.), *Assistant Professor of Surveying.*
420 South Division Street.
- EDWARD LARRABEE ADAMS, Ph.D., *Assistant Professor of Romance Languages.*
1333 Washtenaw Street.
- IRVING DAY SCOTT, Ph.D., *Assistant Professor of Physiological Geology.*
508 Elm Street.
- ROY WOOD SELLARS, Ph.D., *Assistant Professor of Philosophy.*
1114 Prospect Street.
- WILBUR RAY HUMPHREYS, A.M., *Assistant Professor of English.*
1435 Cambridge Road.
- DEWITT HENRY PARKER, Ph.D., *Assistant Professor of Philosophy.*
1025 Baldwin Avenue.
- ALBERT EASTON WHITE, A.B., *Assistant Professor of Chemical Engineering.*
1220 Prospect Street.
- ANTON FRIEDRICH GREINER, Dipl. Ing., *Assistant Professor of Mechanical Engineering.*
1828 Vinewood Avenue.

24 *Members of the Faculty and Other Officers*

WALTON HALE HAMILTON, Ph.D., *Assistant Professor of Political Economy.* 1218 Willard Street.

ALFRED HENRY LOVELL, B.S., *Assistant Professor of Electrical Engineering.* 1132 Michigan Avenue.

GEORGE WILLIAM DOWRIE, Ph.D., *Assistant Professor of Political Economy and Finance.* 520 Walnut Street.

ROBERT TREAT CRANE, Ph.D., *Assistant Professor of Political Science.* 1417 South University Avenue.

WILLIAM FRANK VERNER, B.S., *Assistant Professor of Mechanical Engineering.* 908 Lincoln Avenue.

FERDINAND NORTHRUP MENEFEE, C.E., *Assistant Professor of Descriptive Geometry and Drawing.* 1009 Packard Street.

HERBERT ALDEN KENYON, A.M., *Assistant Professor of French and Spanish.* 1103 Ferdon Road.

CLYDE ELTON LOVE, Ph.D., *Assistant Professor of Mathematics.* 1527 South University Avenue.

GEORGE ROGERS LARUE, Ph.D., *Assistant Professor of Zoology.* 920 Greenwood Avenue.

OTHER OFFICERS OF INSTRUCTION

Instructors Appointed for Three Years

ALICE LOUISE HUNT, *Instructor in Drawing.* 524 Church Street.

EDWARD BRIND ESCOTT, M.S., *Instructor in Mathematics.* 1825 Hill Street.

†THEODORE LINDQUIST, M.S., *Instructor in Mathematics.*

FRANK HOWARD STEVENS, B.S., *Instructor in Mathematics.* 739 East University Avenue.

WILLIAM ALOYSIUS McLAUGHLIN, A.B., *Instructor in French.* 644 South Ingalls Street.

WILLIAM FREDERICK HAUHART, Ph.D., *Instructor in German.* 616 Church Street.

†WILLIAM BEVERLY STONE, Ph.D., *Instructor in Mathematics.*

- HERBERT SAMUEL MALLORY, Ph.D., *Instructor in Rhetoric.*
1910 Cambridge Road.
- WILLIAM VAN NEST GARRETSON, M.S., *Instructor in Mathematics.*
1345 Wilmot Street.
- OTTO CHARLES MARCKWARDT, A.M., *Instructor in Rhetoric.*
1327 South University Avenue.
- †LOUIS ALLEN HOPKINS, M.S., *Instructor in Mathematics.*
- FRANK RICHARD FINCH, Ph.B., *Instructor in Descriptive Geometry and Drawing.*
1619 South University Avenue.
- †FREDERICK WILLIAM WECK, A.M., *Instructor in German.*
- VINCENT COLLINS POOR, M.S., *Instructor in Mathematics.*
1018 Church Street.
- THEOPHIL HENRY HILDEBRANDT, Ph.D., *Instructor in Mathematics.*
513 Elm Street.
- RENE TALAMON, *Licencié-ès-Lettres, Instructor in French.*
1414 Washtenaw Avenue.
- EDGE TAYLOR COPE, 3d, M.E., *Instructor in Mechanical Engineering.*
1220 East University Avenue.
- ROBERT JOHN CARNEY, A.B., *Instructor in Analytical Chemistry.*
720 Whaley Court.
- HARRY NEWTON COLE, A.B., B.S., *Instructor in Analytical Chemistry.*
702 Forest Avenue.
- WILLIAM DANIEL MORIARTY, Ph.D., *Instructor in English.*
309 Thompson Street.
- †ROBERT HARRIS PLAISANCE, A.M., *Instructor in French.*
- WINFIELD SCOTT HUBBARD, Ph.D., *Instructor in Pharmacy, and Acting Secretary of the School of Pharmacy.*
526 Linden Street.
- LEIGH JARVIS YOUNG, A.B., M.S.F., *Instructor in Forestry.*
1827 Hill Street.
- JOHN DAVISON RUE, A.M., *Instructor in Chemical Engineering.*
1204 Oakland Avenue.
- HERBERT DOUGLAS AUSTIN, Ph.D., *Instructor in Romance Languages.*
513 Elm Street.

26 *Members of the Faculty and Other Officers*

- WALTER FRANCIS COLBY, Ph.D., *Instructor in Physics.*
724 South Ingalls Street.
- DANIEL CHAMBERS MILLER, B.S. (C.E.), *Instructor in*
Descriptive Geometry and Drawing. 114 Twelfth Street.
- HUGH BRODIE, B.S., *Instructor in Surveying.* 1024 Hill Street.
- CLIFTON O'NEAL CAREY, B.S., *Instructor in Surveying.*
1009 Michigan Avenue.
- EDMUND WILD, M.S., *Instructor in German.* 547 Elm Street.
- ROBERT WATSON CLARK, A.M., *Instructor in Petrography.*
1082 Ferdon Road.
- CHARLES WILFORD COOK, Ph.D., *Instructor in Economic*
Geology. 502 Elm Street.
- RAYMOND EVERETT, B.S., *Instructor in Drawing.*
720 Twelfth Street.
- SOLOMON FRANCIS GINGERICH, Ph.D., *Instructor in*
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ing. 1029 Vaughn Street.
- ADRIAN JOHN PIETERS, B.S., *Instructor in Botany.*
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- TOMLINSON FORT, Ph.D., *Instructor in Mathematics.*
710 Forest Avenue.
- JOHN J. COX, *Instructor in Civil Engineering.* 1130 Forest Avenue.
- SIDNEY FISKE KIMBALL, A.B., M. Arch., *Instructor in*
Architecture. 13 Cutting Apartments.

APPOINTMENTS FOR THE YEAR 1913-1914

Instructors

- ROBERT BROWN HOWELL, D.D.S., *Instructor in Compara-*
tive Anatomy and Crown and Bridge Work.
1613 South University Avenue.
- ELMER LEROY WHITMAN, D.D.S., *Instructor in Prosthetic*
Technics. 1344 Wilmot Street.
- HERBERT LESTER ABBOTT, B.S., *Instructor in Descriptive*
Geometry and Drawing. 816 Arch Street.

Members of the Faculty and Other Officers 27

- FRANK GEROW TOMPKINS, A.B., *Instructor in Rhetoric.*
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- †ERNEST PETER KUHLE, A.M., *Instructor in Rhetoric.*
- †ALBERT FRANCIS HURLBURT, A.B., *Instructor in French
and Spanish.*
- ROY WILLIAM COWDEN, A.B., *Instructor in Rhetoric.*
1016 Olivia Avenue.
- ALBERT ROSS BAILEY, *Instructor in Surveying.*
732 Packard Street.
- DANIEL LESLIE RICH, A.M., *Instructor in Physics.*
603 Monroe Street.
- WILLIAM WARNER SLEATOR, A.B., *Instructor in Physics.*
727 South Thayer Street
- MARK MARSHALL, A.B., B.S., M.D., *Instructor in Therapeu-
tics and Materia Medica.* 1015 East Huron Street.
- FRANK ALBERT KRISTAL, C.E., *Instructor in Descriptive
Geometry and Drawing.* 1327 South University Avenue.
- RALPH ROBERTSON MELLON, B.S., M.D., *Instructor in
Physical Diagnosis, and Director of the Pathogenetic Lab-
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- MARION CLYDE WIER, A.M., *Instructor in Rhetoric.*
933 Forest Avenue.
- CHARLES AUGUST BEHRENS, Ph.D., *Instructor in Bac-
teriology.* 620 Church Street.
- FLOYD EARL BARTELL, Ph.D., *Instructor in General and
Physical Chemistry.* 423 East University Avenue.
- PETER OLAUS OKKELBERG, A.M., *Instructor in Zoology.*
1216 South University Avenue.
- RICHARD KARL HERMANN FEY, Ph.D., *Instructor in
German.* 1412 Geddes Avenue.
- STUART McCUNE HAMILTON, A.B., *Instructor in Com-
merce and Industry.* 1513 South University Avenue.
- CARL VERNON WELLER, A.B., *Instructor in Pathology in
the Department of Medicine and Surgery.* 924 East Ann Street.

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819 South State Street.
- JAMES ELMER HARRIS, Ph.D., *Instructor in General and
Physical Chemistry.* 820 Arch Street.
- GEORGE McDONALD McCONKEY, *Instructor in Architec-
ture.* 1516 Geddes Avenue.
- HAROLD FORD FRENCH, B.S. (C.E.), *Instructor in Engi-
neering Mechanics.* 525 Linden Street.
- MITCHELL BENNETT GARRETT, Ph.D., *Instructor in His-
tory.* 616 Church Street.
- ROY KENNETH McALPINE, A.B., *Instructor in Analytical
Chemistry.* 619 Whaley Court.
- WALTER ROBERT RATHKE, A.M., *Instructor in French
and Spanish.* 1340 Willmot Street.
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337 East William Street.
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ternal Medicine in the Department of Medicine and Surgery.*
1000 East Ann Street.
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and Surgery.* 918 East Catherine Street.

Members of the Faculty and Other Officers 29

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Gynecology in the Department of Medicine and Surgery.*
University Hospital.

STEPHEN JOHN FARRELL, *Instructor in Physical Training.*
1004 Packard Street.

PHILIP EVERETTE BURSLEY, A.M., *Instructor in French.*
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317 Minerva Street.

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ARTHUR D. DEFOE, A.B., *Instructor in English.*
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SAMUEL J. HOEXTER, M.E., *Instructor in Mechanism, De-
scriptive Geometry and Drawing.*
626 Forest Avenue.

FRANK CLYDE COLE, D.D.S., *Instructor in Clinical Den-
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517 East Ann Street.

ROY ARCHIE MCGARRY, M.D., *Instructor in Anatomy.*
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Engineering.*
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HAROLD PHILIPPI SCOTT, A.B., *Instructor in Rhetoric.*
816 Tappan Street.

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- OLIVE ALTA SMITH, *Stenographer in the University Hospital.* 736 Miller Avenue.

- FRANCES OLIVE LINDSEY, *Stenographer to the Director of the Chemical Laboratory.* 224 Twelfth Street.
- JOSEPH HERMAN GREVE, *Inventory Clerk in the Secretary's Office.* 320 South Seventh Street.
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- JULIA A. L. GLOVER, *Clerk and Stenographer to the Director of University Extension Work.* 520 Hill Street.
- LILIAN WARNER, *General Catalogue Clerk.* 220 South Fifth Avenue.
- RUTH ADELIE ROUSE, *Clerk and Stenographer in the Summer Session.* 727 South Thayer Street.
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- BERTHA CARMAN HERBST, A.B., *Clerk and Stenographer to the Registrar of the Department of Literature, Science, and the Arts.* 313 North Ingalls Street.
- BERTHA LOUISE BECK, *Clerk to the Appointment Committee.* 516 South Division Street.
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- LEE COULTER, *Clerk in the Purchasing Department.* 335 East Jefferson Street.
- DAISY ANDRUS, *Clerk to the University Health Service.* 718 Arbor Street.
- AMY K. GRENNAN, *Addressograph Clerk, General Catalogue.* 505 East Kingsley Street.
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- GRACE M. HALWICK, *Stenographer to the Medical Director of the University Hospital.*
- EUGENIA B. ALLEN, *Clerk and Stenographer to the Dean of the Homeopathic Medical College.* 304 East Jefferson Street.

46 *Members of the Faculty and Other Officers*

ROSA L. SCHUMTZ, *Clerk and Stenographer in the Purchasing Department.* 1714 Wells Street.

JESSIE B. HURD, *Stenographer in the Department of Law.* 1313 Geddes Avenue.

PHOEBE C. O'REILEY, *Clerk in the Purchasing Department.* 721 East Kingsley Street.

Library

RAYMOND CAZALLIS DAVIS, A.M., *Librarian Emeritus.* 521 Church Street.

THEODORE WESLEY KOCH, A.M., *Librarian.* 1809 Hill Street.

FREDERICK PARKE JORDAN, A.B., *Assistant Librarian.* 923 Olivia Avenue.

BYRON ALFRED FINNEY, A.B., *Reference Librarian.* 840 Tappan Street.

FRANCIS LEE DEWEY GOODRICH, A.B., B.L.S., *Assistant Librarian in Charge of Accessions.* 1208 Oakland Avenue.

WILLIAM CHARLES HOLLANDS, *Superintendent of Printing and Binding.* 521 South Division Street.

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FREDERICKA BOTSFORD GILLETTE, A.B., B.L.S., *Assistant Reference Librarian.* 721 South Ingalls Street.

FRANC PEPPARD PATTISON, *Assistant in Charge of the Upper Reading Room.* 532 Packard Street.

ALICE PERSIS BIXBY, *Assistant in Charge of the Chemical Library.* 538 Church Street.

DONNA LOUISE WATKINS, *Assistant in Charge of the Engineering Library.* 314 Packard Street.

KATHERINE GRAHAM CRUTCHER, *Secretary to the Librarian.* R. F. D. 9, Geddes Avenue.

ELISABETH PEARL POND, *Accessions Clerk.* 205 North Ingalls Street.

AMANDA MATHILDA BELSER, *Order Clerk and Accountant.* 600 East Washington Street.

- EILA MAY HYMANS, A.B., *Bindery Assistant*.
517 East Washington Street.
- FLORENCE ADA LENHART, *Assistant in Charge of Circulation*.
115 Park Terrace.
- MABEL FIDELIA McLOUTH, *Cataloguer*. 900 Oakland Avenue.
- ELEANOR CAMPBELL FURMAN, A.B., *Cataloguer*.
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- THERESA ALVINA GRUBE, B.L., *Cataloguer*.
441 South Fourth Avenue.
- DOROTHY MOORE TUTTLE, *Cataloguer*. 613 Packard Street.
- CLARE MULLETT, *Cataloguer*. 414 Benjamin Street.
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- EDITH CLINTON FLEMING, *Assistant*. 1345 Wilmot Street.
- SARAH LOUISE MUNSON, *Assistant*. 523 Forest Avenue.
- EVELYN HARRIET WALKER, *Assistant*.
1111 East University Avenue.
- CLARA COCKER, *Assistant*. 730 South Thayer Street.
- INA FOX, A.B., *Assistant*. 516 East Madison Street.
- FLORENCE DAVEY PETERS, A.B., *Assistant*.
106 Twelfth Street.
- FLORENCE GURLEY ADAMS, *Assistant*.
521 East Jefferson Street.
- BERTHA LOUISE SHAW, *Assistant*. 1108 Hill Street.
- HELENE FAIRCHILD, *Assistant*. 749 East University Avenue.
- GAIL ALICE CURTIS, A.B., *Assistant*. 1027 Forest Avenue.
- NINA WATERBURY, *Assistant*. 904 Packard Street.

Law Library

- VICTOR H. LANE, C.E., LL.B., *Librarian*. 715 Forest Avenue.
- †GERTRUDE E. WOODARD, B.Pd., *Assistant Librarian*.
- ELIZABETH BEAL STEERE, A.B., *Assistant*. Ann Arbor.
- VOLNEY A. CHAPIN, *Assistant*. 803 East Kingsley Street.

Art Gallery, Museum, and Observatory.

- HERBERT RICHARD CROSS, A.M., *Curator of Alumni Memorial Hall.*
7 Cutting Apartments.
- ALEXANDER GRANT RUTHVEN, Ph.D., *Director of the Museum of Zoology.*
1110 Oakland Avenue.
- FILIBERT ROTH, B.S., *Director of the Botanical Garden.*
730 South State Street.
- LEREO NELSON PATTISON, B.D., A.M., *Custodian of the Alumni Memorial Hall.*
532 Packard Street.
- NORMAN ASA WOOD, *Taxidermist.*
1216 South University Avenue.
- ETTA VAN HORNE, *Assistant in the Museum.*
545 Packard Street.
- CRYSTAL THOMPSON, A.M., *Assistant in the Museum.*
520 East Jefferson Street.
- BRYANT WALKER, A.B., LL.B., *Honorary Curator of Mol-
lusca.*
Detroit.
- WILLIAM W. NEWCOMB, B.S., M.D., *Honorary Curator of
Lepidoptera.*
Detroit.
- ARTHUR S. PEARSE, Ph.D., *Honorary Curator of Crustacea.*
Madison, Wis.
- †HENRY JULIUS COLLIAU, *Instrument Maker at the Ob-
servatory.*
- EMIL J. COLLIAU, *Instrument Maker at the Observatory.*
200 South Observatory Street.
- BRADSHAW HALL SWALES, LL.M., *Honorary Associate in
the Museum.*
Grosse Ile.
- ARTHUR W. ANDREWS, *Honorary Associate in the Museum.*
Detroit.
- CHARLES KEENE DODGE, A.B., *Honorary Associate in the
Museum.*
Port Huron.

Hospitals

- JAY BRADFORD DRAPER, *Superintendent of the University
Hospital.*
610 South State Street.
- RUSSELL EBENEZER ATCHISON, M.D., *Superintendent
of the Homoeopathic Hospital.*
109 Glen Avenue.

GENEVIEVE REED, *Acting Superintendent of Nurses in the Homeopathic Hospital.*

JANE M. PINDELL, *Superintendent of Nurses in the University Hospital.*

JAMES PERRY BRIGGS, Ph.C., *Pharmacist in the University Hospital.*

ORLANDO WILLIAM PICKARD, M.D., *Interne in the Homeopathic Hospital.*

WILLIAM GRAMLEY, M.D., *Interne in the Homeopathic Hospital.*

JACOB STERLING WENDEL, A.B., M.D., *Interne in the University Hospital.*

JOHN HINCHMAN STOKES, A.B., M.D., *Interne in the University Hospital.*

Gymnasiums

GEORGE AUGUSTUS MAY, M.D., *Director of the Waterman Gymnasium.* 211 East Huron Street.

PHILIP GEORGE BARTELME, *Director of Outdoor Athletics.* 1111 Michigan Avenue.

CATHARINE LEIGHTON BIGELOW, *Director of the Barbour Gymnasium.* 1004 Oakland Avenue.

LAURA POST, A.B., *Acting Director of the Barbour Gymnasium.* 1004 Oakland Avenue.

STEPHEN JOHN FARRELL, *Instructor in Physical Training.* 1004 Packard Street.

JOSEPH ROBERT APPLGATE, *Instructor in Physical Training.* 555 South Division Street.

EMMA COY SAWTELL, *Assistant in the Barbour Gymnasium.* 520 East Ann Street.

ELSIE ANNA DREFFEIN, *Assistant in the Barbour Gymnasium.* 714 East University Avenue.

Engineering Shops

WILLIAM LINCOLN MIGGETT, M.E., *Superintendent.* 1102 Willard Street.

WILLIAM ROBERTSON McDONALD, *Foreman and Instructor in Forge Shop.* 1200 East University Avenue.

50 *Members of the Faculty and Other Officers*

- WILLIAM HENRY YEATMAN, *Foreman and Instructor in Wood Shop.* 407 West Cross Street, Ypsilanti.
JOHN HUBER STEVENSON, *Foreman and Instructor in Instrument Shop.* 1117 West Huron Street.
J. ERNEST WARREN, *Foreman and Instructor in Foundry.* 110 Ninth Street.
EMORY MORRIS SWEET, *Foreman and Instructor in Machine Shop.* 200 North Thayer Street.
ALONZO SIMMONS BERRY, *Instructor in Wood Shop.* 929 Olivia Avenue.
WILLIAM TELFER, *Instructor in Forge Shop.* 523 Linden Street.
J. D. BOYLAN, *Instructor in the Machine Shop.*
LLOYD FORCE, *Clerk in the Superintendent's Office.* 509 Cheever Court.

Buildings and Grounds

- JAMES H. MARKS, B.S.(M.E.), *Superintendent.* 726 Packard Street.
HAMILTON REEVE, *Assistant Superintendent.* 814 Church Street.
LYMAN R. FLOOK, B.C.E., *Chief Draftsman in the Office of Buildings and Grounds.* 618 Church Street.
THOMAS HOPWOOD, *Chief Engineer.* 104 Vaughn Street.
FRED R. HOUGH, *Chief Electrician.* 1224 East University Avenue.
J. GEORGE LUTZ, *Chief Painter.* 747 Packard Street.
EDWARD C. PARDON, *Chief Carpenter.* 610 West Summit Street.
JAMES H. GALBRAITH, *Chief Steamfitter.* 821 Oakland Avenue.
A. J. CAMPBELL, *Clerk to the Superintendent.*
LOUISE H. SWIFT, *Stenographer to the Superintendent.* 1223 Volland Street.

Board in Control of Athletics

- PROFESSORS A. S. WHITNEY, *Chairman*, G. W. PATTERSON, A. B. STEVENS, and R. W. AIGLER; DIRECTOR P. G. BARTELME; ALUMNI MEMBERS, JOHN D. HIBBARD, JAMES E. DUFFY, and JAMES O. MURFIN; UNDERGRADUATE MEMBERS, LOUIS P. HALLER, ALBERT C. FLETCHER, and H. BEACH CARPENTER.

University of Michigan

THE UNIVERSITY AND THE STATE

THE University of Michigan is a part of the public educational system of the State. The governing body of the institution is a Board of Regents, elected by popular vote for terms of eight years, as provided in the Constitution of the State. In accordance with the laws of the State, the University aims to complete and crown the work that is begun in the public schools by furnishing ample facilities for liberal education in literature, science, and the arts, and for thorough professional study of engineering, architecture, medicine, law, pharmacy, and dentistry. Through the aid that has been received from the United States and from the State, it is enabled to offer its privileges, with only moderate charges, to all persons of either sex, who are qualified for admission. While Michigan has endowed her University primarily for the higher education of her own sons and daughters, it must be understood that she also opens the doors of the institution to all students wherever their homes. It is in this broad, generous, and hospitable spirit that the University has been founded, and that it endeavors to do its work.

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- I. THE DEPARTMENT OF LITERATURE, SCIENCE, AND THE ARTS.
 - II. THE DEPARTMENTS OF ENGINEERING AND ARCHITECTURE.
 - III. THE DEPARTMENT OF MEDICINE AND SURGERY.
 - IV. THE DEPARTMENT OF LAW.
 - V. THE SCHOOL OF PHARMACY.
 - VI. THE HOMOEOPATHIC MEDICAL COLLEGE.
 - VII. THE COLLEGE OF DENTAL SURGERY.
 - VIII. THE GRADUATE DEPARTMENT.

In a Summer Session regular courses of instruction are given in the Department of Literature, Science, and the Arts, the Departments of Engineering and Architecture, the Department of Medicine and

Surgery, the Department of Law, the School of Pharmacy, the Homœopathic Medical College, and the Graduate Department, together with a School of Library Methods and a Biological Station.

On the completion of prescribed courses of study degrees are conferred by the University as follows: In the Department of Literature, Science, and the Arts, the degrees of Bachelor of Arts, and Bachelor of Science; in the Departments of Engineering and Architecture, the degrees of Bachelor of Civil, Mechanical, Electrical, Chemical, Marine, and Architectural Engineering, and Bachelor of Architecture; in the Department of Medicine and Surgery, the degree of Doctor of Medicine; in the Department of Law, the degrees of Bachelor of Laws, Juris Doctor, and Master of Laws; in the School of Pharmacy, the degrees of Pharmaceutical Chemist, Bachelor of Science (in Pharmacy); in the Homœopathic Medical College, the degree of Doctor of Medicine; in the College of Dental Surgery, the degrees of Doctor of Dental Surgery and Doctor of Dental Science; in the Graduate Department, the degrees of Master of Arts, Master of Science, Master in Landscape Design, Master of Science in Engineering and in Architecture, Master of Science (in Pharmacy), Master of Science in Public Health, Civil Engineer, Mechanical Engineer, Electrical Engineer, Chemical Engineer, Marine Engineer and Naval Architect, Doctor of Philosophy, Doctor of Science, and Doctor of Public Health.

Students in any Department of the University may enter the classes in any other Department, upon obtaining permission from the faculties of the respective Departments.

THE UNIVERSITY SENATE

The University Senate is a body composed of the President of the University, the Professors, Associate Professors, Junior Professors, Assistant Professors, and Acting Professors of all departments, and the Librarian. The University Senate is authorized to consider any subject pertaining to the interests of the University, and to make recommendations to the Regents in regard thereto.

The Senate Council consists of the President of the University, the Deans of the several Departments, and members elected by the several faculties as follows: from the Department of Literature, Science, and the Arts, two; and from the Departments of Engineering and Architecture, Medicine and Surgery, Law, the School of Pharmacy, the Homœopathic Medical College and the College of Dental Surgery, one each.

The functions of the Senate Council are as follows:

1. To consider matters appertaining to the general welfare of the University and report upon the same to the University Senate.
2. To communicate to the Regents through the President the action of the Senate.

3. To act for the Senate during vacation periods.
4. To adopt rules and regulations for the transaction of its business and to elect a secretary from its members who is empowered to call meetings at the direction of the President, at the request of two Deans, or three members of the Council, or upon the written request of five members of the University Senate.
5. To call upon members of the University Senate for such service, information, and assistance as may be desirable.

THE LIBRARIES

The libraries of the University are the General Library, the Engineering Library, the Medical Library, the Law Library, the Homœopathic Library, the Dental Library, and the Chemical Library. They contained in the aggregate, June 30, 1913, 322,040 volumes. One thousand five hundred and eighty-three periodicals are regularly received.

THE GENERAL LIBRARY contains 247,761 volumes and 4,580 maps. It includes the following special collections: Parsons Library (political economy), 6,076 volumes; McMillan Shakespeare Library, 6,525 volumes; Goethe Library, 1,131 volumes. The Hagerman Collection and the Dorsch Library, formerly treated as special collections, have, with the approval of the donors been merged in the general collection. One thousand ninety-one periodicals are taken by the General Library.

Within the last few years the library has been enriched by several large and valuable gifts. Among the more important of these that deserve special mention are the historical books, including the Stevens Facsimiles, presented by Mr. Clarence M. Burton, of Detroit; the Morris Philosophical Library, presented by Mrs. George S. Morris; the Alpheus Felch Historical Library, bequeathed by the late Governor Alpheus Felch; the Walter Library of Romance Literature, bequeathed by the late Professor Edward L. Walter; the Stearns Musical Collection, presented by Messrs. Frederick and Frederick K. Stearns, of Detroit; the Germanic Library of the late Professor George A. Hench, presented by his mother, Mrs. Rebecca A. Hench; the Geological Library of the late Professor Israel C. Russell, presented by his widow; and the major portion of the libraries of Richard Hudson, Professor Emeritus of History, and of Elisha Jones, formerly Professor of Greek.

The library is one of the depositories for a set of the printed catalogue cards issued by the Library of Congress; it has acquired a set of those printed by the John Crerar Library, of Chicago; it subscribes, also, to the card publications of the American Library Association, Harvard University, and the Royal Library, Berlin. Within a few years, it is hoped, the bulk of the University's book

possessions will be recorded in a new public catalogue based on these various series of printed cards.

Books may be drawn by all officers and students of the University, and by others having special permission. The reading room for general use will seat 270 readers. Separate rooms are provided for advanced students where work is pursued with the necessary books at hand.

The library is open for consultation fourteen hours daily, except during the summer vacation after the close of the summer session, when it is open ten hours daily. During the regular academic year the library is open on Sundays, for reference use, from 2 to 5:30 p. m. On important legal holidays the library is closed.

The income of the FORD-MESSER BEQUEST of \$20,000, and of the COYL BEQUEST of \$10,000, is used for the increase of the General Library.

THE ENGINEERING LIBRARY, containing 10,230 volumes, occupies a special room in the New Engineering Building and is in charge of an assistant detailed from the General Library. The architectural library, containing 1,800 volumes, is housed in the Engineering Library. In addition, about three thousand books on Engineering and Architecture are shelved with the collections of the General Library. One hundred thirty-nine engineering and twelve architectural periodicals are received.

THE CHEMICAL LIBRARY, containing 4,700 volumes, occupies a special room in the New Chemical Building and is in charge of an assistant detailed from the General Library. In addition, about 3,000 volumes belonging to the chemical collection are shelved in the General Library. Seventy-five periodicals are currently received.

THE MEDICAL LIBRARY, contains 24,106 volumes and 500 pamphlets, is shelved with the General Library, and is consulted under the same regulations. Three hundred fifty-three periodicals are regularly received.

THE LAW LIBRARY, containing 31,726 volumes, occupies the large room on the second floor of the new law building. Thirty periodicals are taken.

THE LIBRARY OF THE HOMOEOPATHIC MEDICAL COLLEGE is shelved with the General Library, and is subject to the same regulations. It contains 3,836 volumes. Thirty-three periodicals are regularly received.

THE LIBRARY OF THE COLLEGE OF DENTAL SURGERY* is shelved in a room in the dental building. It contains numerous sets of valuable periodicals and the most important treatises on the theory and practice of dentistry. The whole number of volumes is 2,744. The library has recently been enriched by the private collection of the late Dr. W. D. Miller, consisting of about three hundred volumes. Ten dental periodicals are taken.

* Named the Taft Library in honor of the late Professor Jonathan Taft, by action of the Board of Regents in July, 1904.

THE ASTRONOMICAL OBSERVATORY

The University Observatory was founded in 1852, through the liberality of citizens of Detroit, and on this account it was named the Detroit Observatory. It is situated on the northeastern border of the city of Ann Arbor, about half a mile from the University. Its principal instruments are a refracting telescope of twelve and one-fourth inches clear aperture, originally constructed by Henry Fitz, of New York, about 1855, but largely rebuilt in 1906-7 in the observatory instrument shop; and a six-inch meridian circle, made by Pistor & Martins, of Berlin, in 1854, and presented to the Observatory by Henry N. Walker, of Detroit. It has also a six-inch equatorial telescope, with objective by Alvan Clark & Sons, mounting by Fauth & Company, and supplied with a new driving clock made in the observatory shop in 1908; a four and one-half inch celestial camera mounted in combination with the six-inch equatorial; a three-inch meridian transit, with zenith telescope attachment, by Fauth & Company; a four and one-half inch comet seeker, made in the observatory shop; mean and sidereal clocks by Tiede and Howard; altazimuth instrument by Wurdemann; theodolite by Brandis; Millionaire and Brunsviga computing machines, chronometers, chronograph, transit, sextants, etc.

A large reflecting telescope has recently been provided for the Observatory. The optical parts of this instrument are from the works of the John A. Brashear Company, of Allegheny. The parabolic mirror has an outside diameter of $37\frac{3}{8}$ inches, and the diameter of the silvered surface is $37\frac{3}{8}$ inches. This telescope is mounted equatorially, and is provided with flat and hyperbolic secondaries so that it may be used as a Newtonian or Cassegrain reflector. It is intended primarily for photographic and spectroscopic work, and a one-prism stellar spectrograph, designed for radial velocity determinations, has been constructed for use in connection with it, by the John A. Brashear Company. The same firm has also supplied an engine for the measurement of spectrograms.

A shop, supplied with excellent machine and hand tools, including a 24-inch lathe, by the Hendey Machine Company, a 24-inch shaper by the Potter & Johnston Company, a toolmakers' lathe by Pratt & Whitney, universal milling machine by Brown & Sharpe, universal grinder by the Cincinnati Milling Machine Company, large and small drill presses, etc., is maintained at the Observatory for the repair and construction of instruments.

The shaper and Hendey lathe are the gifts of Mr. R. P. Lamont, of Chicago, who is also furnishing the means for constructing a 24-inch refractor.

A new building was added to the Observatory in 1908, adjoining the original building on the east, and containing a dome forty feet in diameter for the new reflecting telescope. This building was designed to afford increased facilities for instruction and research.

It contains offices and computing rooms, laboratory and class rooms, dark rooms for photographic work, and special rooms for the seismographs and astronomical clocks.

A set of seismographs for the registration of vibration due to earthquakes was installed in the new building in August, 1909. These instruments are of the best modern construction and give permanent records by continuous mechanical registration. They include the Bosch-Omori horizontal pendulums, each with a steady mass of 220 pounds; a Wiechert horizontal seismograph, two components, also with a steady mass of 220 pounds; and a Wiechert vertical seismograph.

The six-inch refractor and the three-inch meridian transit are mounted in a small observatory near the main building, and are used principally for purposes of instruction. The six-inch refractor is also used as a guiding telescope for astronomical photography by attaching to it a camera carrying a Tessar lens of four and one-half inches aperture and twenty inches focal length.

The larger instruments are intended for research, and when not otherwise employed will be available to that end to such students as have the technical ability to use them to advantage.

For many years the Observatory has been receiving the principal astronomical publications, and its technical library is reasonably complete, including in round numbers about 2,500 volumes. These comprise nearly all the printed star catalogues, most of the modern publications of observatories and astronomical societies, and nearly complete files of the astronomical periodicals.

THE MUSEUMS

The University Museum contains collections illustrative of geology (the mineral collection, for convenience of instruction in mineralogy, being cared for in Tappan Hall), of zoology, and of anthropology. Special collections in botany, materia medica, chemistry, anatomy, and the industrial arts are deposited in the various buildings devoted to the subjects they illustrate. All of these are accessible both to students and to visitors. The University affords a secure depository for objects of value, and it is hoped that frequent gifts will be made to its several collections.

The following descriptions indicate the character of the collections in the University Museum.

I. THE ZOOLOGICAL COLLECTIONS—These are large and valuable.

They include a series of animals from Western United States made by Lieutenant Trowbridge, a large number of specimens from South America and the Philippines collected by Dr. Joseph B. Steere, a considerable amount of material obtained by the Museum Expeditions to various parts of the United States, and the extensive collections of the Michigan Geological and Biological Survey. A special effort is

made to accumulate zoological specimens from all parts of the State, in sufficient quantity to permit of detailed scientific study, and to obtain the foreign forms needed in comparative work. All of the collections are available for study, the specimens being catalogued and systematically arranged, and the mammals, birds, reptiles, amphibians, and insects have also been card catalogued. As far as circumstances will permit, capable persons are given every opportunity to study the collections.

The Mammal Collection contains a valuable series of skins and osteological preparations in addition to the specimens on exhibition. There are about 1,000 specimens in this department, most of which are from Michigan, but foreign types are being acquired as rapidly as possible.

The Bird Collection includes about 7,000 skins and 1,600 mounted specimens. There are large series from Michigan, representing the variations with age and sex in many species, but there are also many specimens from various parts of the new and old worlds. The collection of bird stomachs numbers 2,170 entries. A series of groups illustrating biological facts has been installed. In these groups the natural surroundings are reproduced in detail. There are forty-three types, eight paratypes and two cotypes, representing forty-four species in the collection.

The Reptile and Amphibian Collection contains a large series of Michigan specimens, the variety and number of specimens making it the most valuable collection of its kind in the State. In addition to the Michigan material there are several hundred specimens from various parts of North, Middle, and South America and a rapidly growing series of old world forms. There are two paratypes of one species.

The Fish Collection is nearly entirely composed of Michigan forms. There are about 2,000 specimens, most of which were collected by the various surveys and which are thus accompanied by ecological data.

The Mollusk Collection includes shells of about 6,000 species, representing most of the genera of the land, fresh-water, and marine shells. The specimens have for the most part been identified by experts which makes the collection of special value to the student.

The Insect Collection at present contains 1,500 determined species, representing about 150 families, which are systematically arranged and catalogued. In addition to this there is material probably representing 1,500 species in the hands of specialists for determination and about 60,000 duplicates. The collection is particularly strong in Michigan material, and much of this has been collected by the several Museum and State surveys and is accompanied by ecological data. The material is from nearly every state in the Union, and Europe, Africa, South and Middle America, and the South Pacific Islands. There is a particularly good series, principally economic forms, from the Philippines (the Ledyard Collection). There are types of five species and paratypes of nine species.

Miscellaneous Invertebrates.—The invertebrates other than insects and mollusks consist largely of miscellaneous material for illustrative purposes. The only extensive series is of Crustacea, which comprise a determined collection of Michigan forms and a small amount of extralimital material. There are types and paratypes of four species of Crustaceans.

II. THE ANTHROPOLOGICAL COLLECTIONS.—Among the most notable features of this department of the Museum are:—

a. *The Oriental Section*, including the entire Chinese Collection, mentioned below, weapons, clothing, farm implements, carpenters' tools, porcelains, and idols, from China, Formosa and the Philippines, secured by the Beal-Steere Expedition, and an interesting series of South Sea Island weapons, presented by the Smithsonian Institution.

In 1885 the Chinese government presented to the University the exhibit which it sent to the New Orleans Exposition. A part of the collection, numbering several thousand specimens, is on exhibition in the museum building. It illustrates with special fullness the varieties of Chinese cotton, the Chinese processes of manufacturing cotton and the finished products of cotton and silk. There are many articles showing the skill of the Chinese in working in wood, ivory, and porcelain, in embroidery, and in painting on glass and on silk.

b. *The Stearns Collection of Musical Instruments*, donated by the late Frederick Stearns, A.M., of Detroit, is considered by authoritative critics, both in this country and abroad, one of the most significant of modern collections. It contains about 1,400 examples of every type of musical instrument, and its value for purposes of independent study and original research is heightened by the fact that the scientific aspects of *Instrumentenkunde* have been emphasized rather than mere beauty of form or historic interest. Still these features have not been ignored, as will be observed by a study of the instruments, notably those from India and Japan, while many of the instruments are rich in historical significance. The educational aspects of the collection are emphasized by the fact that Mr. Stearns presented to the General Library a very inclusive collection of books bearing on the subject. This feature will be emphasized still more in the near future, when a complete card catalogue of all references to instruments contained in the General Library will be at the command of students. The collection has recently been transferred to an appropriate room in the Hill Auditorium. Although not formally included in this collection, the Frieze Memorial (Columbian) Organ may be considered as belonging to it, as it is a fine example of organ building in this country at the time of its erection.

c. *The Collection of Peruvian and New Mexican Ceramics*, including an exceptionally fine series of ancient Peruvian burial pottery and modern basins secured by the Beal-Steere Expedition, and an extensive series of New Mexican pottery received from the Smithsonian Institution.

d. *The Modern Indian Section*, including wearing apparel, implements of war and the chase, and household utensils, of the South American, North American, and the Alaskan Indians, and a fine example of the Alaskan totemic column.

e. *The Stone Age Section*, including the local collection of the late David De Pue, a series of Danish implements, and a series of casts of rare implements prepared by the Smithsonian Institution.

III. THE GEOLOGICAL COLLECTION consists of:—

a. The large series of lithological and palæontological specimens brought together by the State geological survey, of which over a hundred fossil species have become the types of original descriptions.

b. *The White Collection*, consisting of about 6,000 specimens of invertebrate fossils.

c. *The Rominger Collection*, embracing about 5,000 species of invertebrate fossils, represented by at least 25,000 specimens. The collection contains (1) the types of all the palæozoic corals, described by Dr. Rominger in the Geological Report of Michigan, volume iii,—not alone the specimens figured, but numerous specimens of each species, which are not duplicates, but illustrations of different characters and varieties; (2) a collection of *Stromatoporoids*; (3) a collection of *Bryozoa*; (4) palæozoic fossils belonging to all the other classes; (5) a collection of European fossils especially rich in Cephalopoda and sponges.

d. A small collection of vertebrate fossils containing, however, much illustrative material and several rare and valuable specimens.

e. *Miscellaneous Donations, Collections, and Purchases*, including a series illustrative of the Metalliferous regions of the Upper Peninsula, collected by the late Professor Alexander Winchell; a collection of cretaceous fossils from the Yellowstone Valley, presented by the late General Custer, U. S. A.

The entire collection, the larger portion of which consists of invertebrate fossils, is estimated to contain approximately 17,000 entries and about 60,000 specimens.

IV. MINERALOGICAL AND PETROGRAPHICAL COLLECTIONS.—The mineral collections comprise more than 40,000 specimens. For instructional purposes several large collections have been arranged. These are (1) a large display and study collection, (2) an unlabeled collection for use in determinative mineralogy, (3) a lecture collection of about 2,500 specimens, and (4) the blowpipe collection. The minerals of Michigan, especially those of the Lake Superior mining region, are well represented by large suites.

The petrographical collections contain several thousand specimens, and consist of (1), a systematic labeled collection for lecture and study purposes. Many of the specimens of this collection were brought together by the older State Geological Surveys. This collection is accompanied by a large number of thin sections. (2) There is also a good collection of unlabeled specimens for determinative purposes.

The University has from time to time come into the possession of various private mineral collections, of which the Lederer, Rominer, Garringer, and Collier collections may be mentioned.

All of the above collections are housed in the Mineralogical Laboratory in the basement of Tappan Hall.

MUSEUM OF THE FINE ARTS AND HISTORY

The works of art belonging to the University have been removed from the galleries formerly occupied by them in the library building and have been installed in the new Alumni Memorial Hall. A printed catalogue, prepared by Professor Martin L. D'Ooge, contains fuller descriptions than can here be given. The collection was begun in 1855. It contains a gallery of casts, in full size and in reduction, of some of the most valuable ancient statues and busts, such as the Hermes, the Apollo Belvidere, the Laocoon, the Wrestlers, and the Sophocles; more than two hundred reductions and models in terra cotta and other materials; the statue of Nydia by Randolph Rogers; casts of modern statues, busts, etc., and reliefs; a number of engravings and photographic views, illustrating especially the architectural and sculptural remains of Ancient Italy and Greece; a small collection of engraved copies of the great masterpieces of modern painting; two series of historical medallions—the HORACE WHITE COLLECTION, presented by Honorable Andrew D. White, and the GOVERNOR BAGLEY COLLECTION—the former illustrative of ancient, mediæval, and modern European history, the latter designed to embrace the commemorative medals struck by order of Congress or other authorities, and now containing one hundred such medals; and a large collection of coins, chiefly Greek and Roman, presented to the University by the late Dr. Abraham E. Richards.

THE ROGERS GALLERY comprises the entire collection of the original casts of the work of the late Randolph Rogers, more than a hundred in number. It was given by that distinguished sculptor to the State of Michigan for the University museum.

THE LEWIS GALLERY, bequeathed to the University by the late Henry C. Lewis, of Coldwater, comprises about four hundred and fifty paintings and forty pieces of statuary.

Through the generosity of Mr. Henry P. Glover, of Ypsilanti, the University has recently acquired possession of the valuable De Criscio collection of Latin inscriptions, about 250 in number, ranging in age from the reign of Augustus to the 5th century, A. D. The most of the inscriptions are on slabs of marble.

The late J. Q. Adams Fritchey, A.M., of St. Louis, Mo., a graduate of the class of 1858, bequeathed to the University a collection of modern coins, medals, and medallions, numbering about one thousand, issued prior to 1876, and possessing historic value and interest to numismatists.

Dr. Henry Smith Jewett (A.B., 1868), of Dayton, Ohio, has recently presented to the University a complete set of the various issues of fractional currency put out by the United States government during the Civil War and Reconstruction periods. Accompanying this collection is a nearly complete set of the "documentary" stamps issued by the government during the Civil War.

A small but valuable collection of Egyptian antiquities has recently been presented by A. M. Todd, Esq., of Kalamazoo, Mich.

SPECIAL COLLECTIONS AND MUSEUMS

THE BOTANICAL COLLECTION is shelved in the botanical laboratory, and contains, in addition to plants collected by the public surveys, several valuable herbaria and sets of plants that have been presented to the University or purchased from time to time. Among these some of the most important are the HOUGHTON HERBARIUM, the SAGER HERBARIUM, the AMES HERBARIUM, the HARRINGTON COLLECTION, the BEAL-STEERE BOTANICAL COLLECTION, the ADAMS-JEWETT COLLECTION, and the GARRIGUES COLLECTION, all of which have been described in Calendars of previous years.

Among the more recent acquisitions are Collins, Holden, and Setchell's *Phycotheca Boreali-Americana*, Brioso and Cava's *Fungghi Parasiti*, Seymour and Earle's *Economic Fungi*, Ellis's *North American Fungi*, presented by Mr. Joseph B. Whittier, large additions to the cryptogamic flora of Michigan, arranged and catalogued by the late Mr. Lorenzo N. Johnson, and nearly 2,000 species of plants, mostly phanerograms, collected by Mr. Lewis Foote while engaged in the United States Lake Survey, and presented by him to the University.

In addition to these *exsiccati*, there is an extensive collection of material mounted in alcohol or formalin in museum jars, illustrating the biological relations of plants.

The collections of PHARMACOGNOSY and INDUSTRIAL CHEMISTRY occupy a floor space of 2,500 square feet in the chemical building, and are briefly described as follows:

The PHARMACOGNOSY COLLECTION comprises several thousand mounted and labeled specimens of products from all parts of the world, such as are used for medicinal, alimentary, and industrial purposes. The articles are of vegetable and of animal origin and are arranged in the present system of scientific classification. Water-color plates and photographs, showing the form and habit of the plant, accompany the crude drugs and their products. Series of chemical constituents, isolated by students, and mounted in part in the relative proportions in which they exist in the plant, make up a phytochemical exhibit of composition. There is a set of drawings and wall-charts of the histological structure of drugs, foods, and condiments, for aid in the study of adulteration, together with photomicrographs of longitudinal and transverse sections.

The cultivation and preparation for the market and the commerce of these articles among the peoples of the earth are illustrated by collections of authentic photographs, many of which have been expressly procured for the study of commerce with distant parts of the world.

CHEMICAL INDUSTRY.—In this collection the natural resources and chief manufactures of Michigan, and of various parts of the world, are illustrated. Crude materials, raw and unfinished products, as well as completed articles of commerce in their several grades, are displayed, together with models and plans of reproduction by modern methods. Among the branches of industry and articles of manufacture represented are petroleum products; Portland cement; clay wares; the beet-sugar manufacture; the great alkali works; starches, oils, and other maize products; wood distillation; the coal-tar dyes. These illustrations of the several branches of chemical technology are for the most part subject to continuous change from the results of the work of the laboratory and the material offered for investigation.

THE MUSEUM OF ANATOMY AND MATERIA MEDICA and the **DENTAL MUSEUM** are housed in the buildings of the Medical and the Dental Departments, respectively, and are described in the chapters devoted to those departments.

THE LABORATORIES

In the several laboratories of the University opportunities are provided for practical instruction in physics, chemistry, mineralogy, geology, zoology, psychology, botany, forestry, actuarial work, engineering, histology, physiology, hygiene, electrotherapeutics, pathology, anatomy, and dentistry.

The laboratories designed primarily for students of engineering, of medicine, and of dentistry are described in the chapters devoted to the engineering, the medical and the dental departments.

PHYSICAL LABORATORY

The first floor of the physical laboratory is devoted to experimental work in heat, electricity and magnetism, and to research. It contains about 8,000 square feet and is divided into fourteen rooms, including a battery room, a large laboratory for advanced work in heat, another large room for electrical measurements, and a smaller one for photometry. Two rooms are used for elementary instruction in direct and alternating current machinery and are equipped with various types of machines in common use, with the necessary instruments for testing. The rest of the rooms on this floor are used for research.

The battery room contains two storage batteries; one consisting of one hundred and twenty cells, of ten ampere capacity, and one, consisting of eighteen cells, of twenty-five ampere capacity. A switch-board, wired to all parts of the building serves for the distribution of current from the batteries as well as the 220 or 110 volt direct current from the University power house and the 110 volt alternating current from the city lines. Compressed air is also available in several rooms.

On the second floor are two lecture rooms, one seating one hundred twenty and the other four hundred students. An apparatus room is adjacent to each lecture room. This floor contains in addition a large laboratory for beginners, the library, an office, and three research rooms.

The third floor contains eleven rooms, the largest of which is used as a second laboratory for beginners. Two rooms are used as class rooms and the rest for the advanced work in sound, light, and electrochemistry.

The laboratory is well supplied with apparatus from the best European and American makers. The list includes accurate standards for all kinds of physical measurements, a dividing engine, chronograph, and a large number of chemical balances, tuning forks, and resonators from Koenig. In light, it includes seven spectrometers, two Abbé-Pulfrich interferometers, a Michelson interferometer, a polariscope from Schmidt and Haensch; in heat and electricity, pyrometers, a Callendar bridge, a thermogalvanometer, three potentiometers, several pieces of apparatus for magnetic testing, a Siemens and Halske oscillograph, and many other standard instruments.

The annual budget allows the addition each year of apparatus needed for the work of graduate students and for illustration of recent advances in physics.

CHEMICAL LABORATORY

The chemical laboratory occupies a four-story fire-proof building erected in 1909 at a cost of more than \$300,000. In shape it is a rectangle 230 by 130 feet enclosing two courts. It contains 125 rooms and has a total floor area of 104,500 square feet. Ventilation is provided by eight fans capable of changing the air in the entire building every eight minutes, and the temperature is controlled by thermostats. The concrete construction of the building allowed an exceptionally liberal amount of window space, and artificial illumination by tungsten lamps is provided on an equally generous scale. There are three lecture rooms with preparation rooms adjacent, and five class rooms. The dispensing rooms and store rooms occupy a stack in the center of the building extending from the basement to the attic, with provision for dispensing on each of the main floors.

The building contains a library in which are shelved about 5,000 volumes, constituting the bulk of the chemical library. The older

books and journals which are not frequently referred to have been left in the general University library. Eighty-four journals dealing with chemistry and its various applications are regularly received. The library is especially rich in its complete files of journals, there being full sets of all the common chemical journals and of many which are comparatively rare.

The reading room accommodates eighty-five readers.

All the chemistry for the various Departments of the University, except the technical chemistry of the Department of Medicine and Surgery, is taught in this building. About fifty courses are offered each semester, which are attended by over 1,400 students. More than 1,000 of these do laboratory work.

There are nine large student laboratories, each approximately 42 x 58 feet, two being assigned to general chemistry, two to qualitative analysis, two to quantitative analysis, one to organic chemistry, one to pharmacy, and one being held as an overflow for such work as most needs it. Somewhat smaller laboratories accommodating from twenty-four to thirty-six students are assigned to physical chemistry, chemical technology and gas analysis. Smaller laboratories are provided for advanced work in general, inorganic, physical, organic, pharmaceutical, and metallurgical chemistry, as well as specially equipped rooms for electrochemistry, work involving constant temperatures, spectroscopy, photometry, photography, calorimetry, pyrometry, metallography, assaying, the manufacture of Portland cement, and other processes involving high temperatures. The offices and private laboratories of the teaching staff are located close to the appropriate student laboratories.

In addition to a full supply of routine materials and apparatus for work in general, analytical, organic, physical, pharmaceutical, and technological chemistry, facilities are offered for advanced study and research along many lines. For the preparation of raw materials, there are adequate grinding mills, both hand and power, for a wide variety of work. A continuous extraction apparatus holding twenty liters, a hydraulic press capable of exerting a pressure of five thousand pounds per square inch, a small filter-press and a power-driven centrifugal machine are also provided. Direct current is available at various voltages from storage batteries, rotary transformers, and the 220-volt power plant for electrochemical or electrothermal work. There are various types of resistance, resistor, and arc furnaces, as well as oil and gas fired furnaces for high temperature work, and both electrical and optical pyrometers. The laboratory is well equipped with apparatus for the most delicate measurement of resistance and electro-motive force. Facilities are provided for the preparation and microscopic or photomicrographic examination of specimens either in thick polished section by vertical illumination or in thin section by either plane or polarized light. Ninety analytical balances are distributed in eleven balance rooms and in private laboratories, and others for heavier loads or of greater delicacy are reserved for special purposes.

MINERALOGICAL LABORATORY

This laboratory occupies ten rooms in the basement of Tappan Hall and has a total area of over 6,000 square feet. One large room is used for general laboratory purposes, another is devoted to blowpipe methods and chemical crystallography, while a third is used for petrography, crystal measurement and drawing. Another large room contains the display and study collection of minerals. The collections of the laboratory are extensive and comprise over 40,000 specimens. (For a description see page 59.) There is also a well appointed lecture room directly in connection with the general laboratory and mineral collections. Of the other rooms mention may be made of four small dark rooms for goniometric and optical investigations.

The general laboratory is well equipped with crystal models, natural crystals, and working collections for the rapid determination of minerals, principally by means of the physical properties. It is also equipped with goniometers, polarization microscopes, and other crystallographic-optical instruments necessary for the thorough study of crystals. These instruments are all of the most modern and approved types. The laboratory also possesses good lecture and working collections of rocks and thin sections. The blowpipe laboratory possesses ample facilities for carrying on blowpipe tests, both upon plaster tablets and charcoal, as well as all other chemical reactions useful in the determination of minerals.

The facilities of the laboratory are such that, aside from the general courses, special attention is given to graduate and research work along the line of crystal measurements, chemical crystallography, and general mineralogy.

GEOLOGICAL LABORATORY

The laboratories for geology are located in the Museum building and in the basement of the Economics building. They include a general laboratory for geology, a laboratory for historical geology and paleontology, and a soil laboratory. In addition, the Russell Seminary Room on the top floor of the Museum building is fitted up as a physiographic laboratory. On shelves and in cases are arranged for convenient use the books, maps, and pamphlets of the Russell Library, and in addition a large collection of topographic atlas sheets, and other physiographic maps. Upon the walls have been placed a set of Howell's models of the continents, and in cases are stored a collection of wall charts and diagrams. Other physical and paleontological maps and models are kept in the large lecture room on the first floor of the building. The room is supplied with a projecting lantern.

The general laboratory is in use for general geology, for economic geology and ore deposits, and is provided with special apparatus and with mineral and rock sets, collections, models, maps, etc.,

as well as with a projecting lantern. The laboratory for paleontology is supplied with working sets of characteristic fossils, with the Zittel and other paleontologic wall charts, and with a comprehensive series of lantern slides. The room adjoins the geological museum, where reference and type specimens are displayed and can be drawn upon for special studies. The soil laboratory in the Economics building is provided with necessary apparatus for the chemical and mechanical analysis of soils and has desks to accommodate a class of eighteen students. For lectures in general, glacial, seismic, and tectonic geology the collection of lantern slides is particularly comprehensive.

BOTANICAL LABORATORY

In the botanical laboratory instruction is given in the practical study of the structure, development, physiology, and classification of plants, and opportunity is offered for investigation in cellular biology, in embryology and development, in physiology, mycology, pathology, ecology, and genetics.

The laboratory comprises six large rooms for general work, five smaller rooms for the work of instructors and investigators, a room for alcoholic material, dark rooms, and store rooms. The section assigned to morphology and cytology is provided with microscopes (among them a Zeiss microscope with mechanical stage, apochromatic objectives, and compensation oculars), camera lucidas, polarizing apparatus, and photographic cameras; Cambridge Minot-Zimmermann, Jung, and freezing microtomes; sterilizers, means for imbedding, stains and reagents, Wardian cases, and aquaria. The equipment for physiology, besides work rooms provided with chemicals and general apparatus, includes a conservatory, a dark room with constant temperature, incubators, sterilizers, horizontal microscopes, balances, thermographs, barometer, auxanometers, klinostats, and centrifuges. The heavier machines are driven by water motors and an electric motor. There is a good working library in the laboratory, containing, besides many monographs, the leading botanical periodicals of the world.

BOTANICAL GARDEN AND ARBORETUM

Through the gifts of friends and an agreement with the city of Ann Arbor, the University has come into possession of a parcel of land containing about ninety acres. The city co-operates with the University in developing this tract as a botanical garden and arboretum.

The land is within the eastern boundry of the city of Ann Arbor and fifteen minutes' walk from the campus. It has a frontage of more than three-quarters of a mile on the Huron River. The topography is exceedingly varied, the highest point being 185 feet above the river. The soils vary from heavy clay to light sands,

About fifteen acres of hillside and ravine are already covered with native trees, shrubs, and herbaceous plants. A greenhouse, with laboratory adjacent, has recently been completed. This will be devoted entirely to experimental work connected with the garden and the botanical laboratory. The following plantings have been made:—(1) An experimental garden devoted to the work in plant breeding, (2) a shrub garden, (3) a medicinal garden, (4) a pinetum, (5) a nursery.

In the nature of the case years must elapse before the development of the grounds can express the features planned. But from the very beginning the garden will be of benefit to the University, especially for the work in plant ecology, forest botany, and landscape design.

ZOOLOGICAL LABORATORY

The zoological laboratory comprises twenty rooms in the second and third stories of the south wing of University Hall, with about 8,000 square feet of floor space; it is lighted by fifty-six windows. There is a large room for the elementary work of students, and four smaller rooms for more advanced work. These rooms accommodate sixty-six students at one time. All rooms are provided with water and gas, and are fitted with tables especially designed for the work. A room for work in experimental zoology, a small lecture room, and a photographic room have been equipped, each for its special use. There is room in the museum building for the use of persons engaged in the study of museum material.

There is a good equipment of microscopes, of microtomes, of Zeiss's photographic apparatus, and of other accessories. For illustrative purposes, there is a collection of alcoholic specimens (many of them from the Naples Zoological Station), and a full collection of Lueckart's Nitsche's, and Lendenfeld's wall charts. For field work there are provided collecting apparatus and field glasses for the individual use of students and photographic cameras, a boat, and larger pieces of collecting apparatus for collective use.

PSYCHOLOGICAL LABORATORY

The psychological laboratory is in a detached building. It contains fourteen rooms of various sizes for general laboratory work and research, including two dark rooms with outside windows. The rooms are all wired so that they can be connected electrically or be supplied with low potential currents from a dynamotor and storage batteries. The rooms are amply supplied with water and gas. Sufficient power for all purposes is furnished by electric motors.

The equipment includes a complete set of apparatus for the work of elementary experimental classes, models of the brain and sense organs, Hipp chronoscopes, kymographs, a large pendulum and gravity chronograph to regulate the registration apparatus, the minor ac-

cessories for reaction work, Meumann's time sense apparatus, the Marbe color mixer, a practically complete set of Hering's instruments for color determinations, the various instruments made by Verdin for recording the movements of the vocal organs, a fall phonometer of improved design, a hydraulic air compressor for blowing the siren and Appunn's reeds, an Ellis harmonical, forks by Koenig, Edelmann, and Appunn, a Stern tonvariator, and an unusually complete series of instruments for recording variations in circulation, respiration, and voluntary effort under the influence of mental states. In addition, there are many of the usual instruments for work in other lines. Such apparatus as is needed for advanced work or research will be procured as required. Every facility and encouragement is offered to students of sufficient preliminary training to undertake investigation on special problems.

FOREST LABORATORY

In the forest laboratory students receive instruction in forest botany, timber physics, structure of woods, and certain features of wood technology, as well as in forest measurements and the methods of study of the growth of timber. A good collection of wood specimens, sections of trees, and herbarium material is provided and will be increased as rapidly as possible. There is an ample supply of microscopes, compasses, calipers, height measures, and other apparatus for use in the laboratory and in the field.

A special nursery for the propagation of forest trees within ten minutes walk of the campus has been developed so as to be available to the forestry students in the spring of 1913. This nursery is equipped to demonstrate certain phases of silvicultural work and the methods of commercial nursery practice from the preparation of the seed beds to the packing for shipment of the mature seedling. Quarters are provided on the grounds for the proper accommodation of students working in the nursery and for the detailed study of nursery work and investigation.

SAGINAW FOREST FARM

Special facilities for the study of forestry are supplied by the Saginaw Forest Farm, a tract of land about one mile west of the city of Ann Arbor, presented to the University by the Honorable Arthur Hill, of Saginaw. The farm, comprising eighty acres, is a typical example of the low hilly land of the drift district, and contains as great a variety of topographical and soil conditions as could be expected in an area of this extent. Its soils vary from heavy clay to sandy gravel. In addition to its other good features, there is a lake of clear water, from ten to fifty feet deep and covering an area of twelve acres.

The farm is to serve as an object lesson in forestry. Upon it provision is to be made for (1) an arboretum of all useful forest

trees that can grow in Michigan; (2) demonstrative ideas for seed-bed and nursery work; (3) model plantations of forest trees, and (4) special experiments in forestry, relating to various methods of propagating different kinds of timber, to the raising of particular forest products, and to other practical purposes.

STATISTICAL LABORATORY

This laboratory is equipped with various instruments to facilitate the computation and tabulation of statistics; among these may be mentioned one twenty-figure Millionaire arithmometer, one sixteen-figure Millionaire arithmometer, one sixteen-figure Tate arithmometer, one thirteen-figure Brunsviga arithmometer, several adding machines, and a tabulating typewriter. Students are instructed in their use in the preparation and tabulation of premiums, reserves, and other schedules required in the practical work of insurance offices and statistical bureaus. The laboratory also contains a working library comprising complete sets of most of the important actuarial journals and text-books on actuarial theory. Reports on vital and other statistics are drawn from the general library when required.

NEW SCIENCE BUILDING

A new building four stories in height and with a floor space of approximately 165,000 square feet, with a lecture room seating five hundred, and provided with the latest equipment and appliances, is now in process of erection. It will be ready for occupancy in the fall of 1915, and will house the departments of psychology, mineralogy, geology, zoology, botany, and forestry, with their laboratories. A fuller description will be given in the Calendar for 1914-1915.

OTHER FACILITIES FOR INSTRUCTION

For descriptions of the various laboratories, shops, museums, etc., used in connection with the work in the professional Departments, see chapters on the several Departments.

THE HOSPITALS

There are two hospitals connected with the University, affording ample facilities for clinical instruction. One of them is under the direction of the Faculty of the Department of Medicine and Surgery; the other is in charge of the Faculty of the Homœopathic Medical College. Further information in regard to the hospitals is given in the chapters of the medical Departments.

AIDS TO MORAL AND RELIGIOUS CULTURE

The churches of the city of Ann Arbor are cordially thrown open to the students, whose interests are largely consulted by the pastors in their pulpit instruction and in their plans of work. There are churches of the following communions in the city: Baptist, Congregationalist, the Disciples, English Lutheran, German Lutheran, German Methodist, Methodist Episcopal, Presbyterian, Protestant Episcopal, Roman Catholic, and Unitarian.

The Students' Christian Association, comprising the University Young Men's Christian Association, and the University Young Women's Christian Association, has a large membership. It holds meetings for religious and social improvement.

The work for college men is carried on under this organization in a building at 212 South State Street. The general meetings are held in Newberry Hall. The University Young Men's Christian Association is affiliated with the World's Student Christian Federation, and the Graduate Secretary of the Students' Christian Association is its General Secretary. He spends practically his entire time in the interests of college men.

The work for college women is carried on in Newberry Hall, opposite the University campus on State Street. The University Young Women's Christian Association was organized in 1901, and at present has over one hundred and fifty members. It is affiliated with the State and national associations, and has a General Secretary who devotes her time to the interest of college women.

An organization known as the Federation of Christian Workers acts as a clearing house for all religious and social work among the young people of Ann Arbor.

Guilds and other societies, consisting chiefly of students, have been organized in several of the churches both for religious and moral culture and for social entertainment. The Hobart Guild, connected with St. Andrew's Church (Protestant Episcopal), has a commodious building, called Harris Hall, planned and equipped for the objects of the guild; and two of the several lectureships contemplated in its plans have been endowed,—The Baldwin Lectureship for the Establishment and Defense of Christian Truth, and the Charlotte Wood Slocum Lectureship on Christian Evidences. The work is under the immediate charge of a Curate.

The Tappan Presbyterian Association owns the buildings known as McMillan and Sackett Halls; it has a theological library of several thousand volumes, and one of its purposes is to maintain courses of lectures upon church history and church work. Its secretary, known as a Student Pastor, has his office in Sackett Hall. Its active work centers about the Christian Endeavor Society of the local Presbyterian Church.

The Methodist Episcopal Church has organized the Wesleyan Guild, and has a permanent fund for the support of the Henry M. Loud Lectureship. The work is in charge of a Permanent Secretary.

The hall of the Baptist Students' Guild (Tucker Memorial), opposite the First Baptist Church, is the center of work among Baptist students. The two upper floors have students' quarters, accommodating fifteen men, while the first floor, with its library, reading and music room, and office, is used for general social and religious purposes. The Guild also employs a Director who devotes his whole time to the student work.

The Young People's Religious Union is a society formed in the Unitarian Church with similar purposes.

The society organized in connection with the Church of the Disciples is called the Inland League.

All Catholic students are expected to become members of the Students' Catholic Club, which meets twice a month in St. Thomas Parish Hall. The society is under the personal supervision of the pastor of St. Thomas' Church. Its object is both social and religious. A fund is being collected with which to erect a Catholic Club building.

The Christian Science Society was formed in accordance with the Manual of the First Church of Christ, Scientist, in Boston, Mass. Students and alumni of the University who are members of The Mother Church are eligible to membership.

The Michigan Menorah Society is an organization, open to all members of the University, devoted to the study and advancement of Jewish culture and ideals. It attempts, formally through the regular university courses, and informally by means of special lectures, original papers, and free discussion, to stimulate an interest in, and spread a knowledge of the history, the literature, the religion, and the current problems of the Jewish people. It is affiliated with the Intercollegiate Menorah Association.

FACILITIES FOR PHYSICAL TRAINING

Gymnasiums.—The University has two gymnasiums, one for men and one for women, erected at a cost of about \$125,000. The former is called the Waterman Gymnasium; the latter, the Barbour Gymnasium. In the conduct of the gymnasiums the aim is not so much the development of a few gymnastic experts as the provision of wholesome physical exercise for the many. The facilities of the buildings, including the physical examinations (which every locker holder must take) and instruction, are free to all students, the only charge being a rental of \$2 a year for a locker for men students, \$1 for women. A physical examination and a stated amount of gymnasium work in regular classes are required of students in the Department of Literature, Science, and the Arts, and in the Department of Engineering during their first year of residence at the University. For other students, gymnasium work, for the present, is voluntary.

PHYSICAL TRAINING FOR MEN

The Waterman Gymnasium.—The Waterman Gymnasium was named in honor of the late Joshua W. Waterman, of Detroit, who contributed largely to its cost. The main floor is a rectangle with truncated corners and dimensions of 150 by 90 feet, and is well equipped with the various kinds of apparatus usually found in the best modern gymnasiums. Several smaller rooms are devoted to administration, fencing, boxing, and other special purposes, while the basement is given up to baths and lockers. The main hall is lighted in the daytime through a large skylight 66 feet above the floor, and in the evening by electricity. A gallery makes room for an elliptical running track 375 feet in length.

Before beginning gymnasium work each student receives a thorough physical examination in order to eliminate those who are not physically capable of doing the regular class work.

Freshmen in the Department of Literature, Science and the Arts and the Department of Engineering are required to take one year of gymnasium work, consisting of two one-hour periods per week. This work begins the first Monday in November and ends at the Spring Recess.

Dexter M. Ferry Athletic Field.—By the generosity of Mr. Dexter M. Ferry, of Detroit, an addition of about twenty-five acres has been made to the grounds formerly known as Regents' Field. The combined tract of thirty-five acres lies a few minutes' walk southward from the campus, and is set apart and equipped especially for open-air sports.

Supervision of Athletic Sports.—The general supervision of athletic sports is vested in a Board of Control, consisting of eleven members.* The Board thus constituted has charge of all matters involving the relation of athletic sports to the University; for example, the eligibility of players proposed for any University team, the arrangement of intercollegiate games, the granting of leaves of absence, and the investigation of charges of misconduct on the part of players. The policy of the Board is to foster the spirit of honor and gentlemanliness in athletics, to suppress evil tendencies, and to see that play shall not encroach too much upon the claims of work. For the furtherance of these ends certain specific rules and regulations have been adopted, a copy of which can be had on application to the Secretary of the University.

* The Board of Control for the year 1913-1914 consists of Professors Whitney, Patterson, Stevens and Aigler, Mr. Philip G. Bartelme, Messrs. John D. Hibbard, James E. Duffy, and James O. Murfin, and Messrs. Louis P. Haller, Albert C. Fletcher, and H. Beach Carpenter. Mr. Bartelme is Director of Outdoor Athletics.

INTRAMURAL ACTIVITIES

Steps have been taken to furnish competent and adequate instruction, in all branches of athletics, to all students in the University desiring such instruction.

Any student applying for special instruction, or attention, in any branch of athletics will now receive the attention of a competent coach, regardless of the athletic ability of the applicant.

It is also hoped that the work will be of such a nature as to stimulate the growth of all athletic activities, especially of a Non-Varsity character.

FERRY FIELD EXTENSION

Anticipating the growth of inter-class athletics, and the consequent necessity for additional field space, the Athletic Association has purchased thirty-eight and seven-tenths acres of land, immediately adjoining Ferry Field, on the south. This land is now being graded, tiled, and sodded, and will be marked off into gridirons and diamonds for the exclusive use of the class teams.

PHYSICAL TRAINING FOR WOMEN

The Barbour Gymnasium.—The Barbour Gymnasium is named in honor of the Honorable Levi L. Barbour, of Detroit, a former Regent of the University and a liberal contributor to the funds for its erection. The building contains, in addition to the gymnasium proper, the offices of the Dean of Women and the Director of the Gymnasium; a club room and parlors for the college women, a hall (Sarah Caswell Angell Hall) accommodating 550 people, for lectures, meetings, theatrical entertainments, etc. The gymnasium is a large room with floor space 90x80 feet, well lighted, well ventilated, and amply equipped with the necessary apparatus for individual and class work. The gallery has a running track 310 feet long. The basement contains dressing rooms, shower baths, and a swimming tank which is open to all women registered in the gymnasium, with instruction in swimming free of charge. Before beginning the gymnasium work each student receives a careful physical examination made by the Director of the Gymnasium and the University Physician for Women, and the work is assigned accordingly. If a girl is physically unable to undertake the general class work she is given individual work carefully adapted to her own need. Especial attention is given to the correction of faulty posture and any deformity that may be benefited by intelligent exercise. Tennis, basket ball, hockey, archery, and cross country walks form part of the fall and spring work. Owing to the necessity of having uniform gymnasium suits they should not be purchased before entering college. If it is necessary to do this, communication should first be made with the Director of the Gymnasium in regard to the material and style required.

Palmer Field.—The Women's League has purchased, with the help of the Alumnae and a very generous gift from the Honorable Thomas W. Palmer, of Detroit, a tract of seven and one-quarter acres of land situated within five minutes' walk of the gymnasium. Hockey and basket-ball fields, tennis courts, and an archery range provide ample opportunity for varied outdoor exercise.

Class Work.—Three periods a week of physical training are required of first year students. Class work in the gymnasium begins the first Monday in November. During October and from the spring recess to June 1 there will be regular work on Palmer Field.

For detailed information concerning courses see page 123.

ORATORICAL ASSOCIATIONS

In addition to the University instruction in oratory, an active and earnest interest in public speaking is fostered and maintained through the agency of voluntary associations of students, which arrange and conduct debates and oratorical contests and co-operate with similar organizations in other institutions.

UNIVERSITY ORATORICAL ASSOCIATION

The University Oratorical Association was organized by students of the Department of Literature, Science, and the Arts, and of the Department of Law, under the guidance of the professor of oratory, to foster an interest in oratory and debate, and also to participate in the annual contests of the Northern Oratorical League, the Central Debating League, the Hamilton Club, and the Intercollegiate Peace Association, and in such other contests as may be arranged by the association.

At the annual oratorical contest held the third Friday of March, the students who take first and second honors, respectively, are chosen to represent the University as orator and alternate in the annual contest of the Northern Oratorical League. In 1913 the first and second honors were awarded, respectively, to Percival Victor Blanshard and Harold Elijah Goodenow.

Kaufman Testimonial.—Nathan M. Kaufman, of Marquette, Michigan, provides annually \$150, to be awarded as follows: \$100 to the student who shall win first honor in the University Oratorical Contest, and \$50 to the student who shall win second honor.

Chicago Alumni Medal.—The Chicago Alumni Association of the University of Michigan offers annually a bronze medal as a testimonial for excellence in oratory. The medal, designed by Mr. Louis H. Sullivan, of Chicago, is given to the student who is awarded the first honor in the University Oratorical Contest.

NORTHERN ORATORICAL LEAGUE

The Northern Oratorical League is composed of the oratorical associations of the University of Michigan, Northwestern University, the University of Wisconsin, Oberlin College, the State University of Iowa, the University of Minnesota, and the University of Illinois. Its purpose is to foster an interest in public speaking and to elevate the standard of oratory, by holding annual contests. The contests are open only to undergraduates.

Lowden Testimonial.—To encourage public speaking in the universities whose oratorical associations compose the Northern Oratorical League, the Honorable Frank O. Lowden, of Chicago, in 1901 established an endowment fund, amounting to \$3,500, and placed it in the hands of the Regents of the State University of Iowa, as trustees. From the interest annually accruing therefrom the sum of \$100 is awarded to the person receiving first honor at the annual contest of the Northern Oratorical League and \$50 to the person receiving second honor.

PEACE CONTEST

The Peace Contest is held annually under the auspices of the Intercollegiate Peace Association. Preliminary contests are held in Illinois, Indiana, Michigan, Minnesota, Ohio, Pennsylvania, and Wisconsin, and the winners of these contests compete in an Interstate Contest, held in April each year, and the winners of the various sectional contests throughout the United States will compete in the National Contest, held in May at the annual convention of the Lake Mohonk Conference, New York. The orations must not exceed sixteen minutes in delivery, and must deal with some phase of the general subject of international peace or arbitration. This contest is open to all students of the University who are doing at least twelve hours of regular work.

The representative of the University of Michigan in 1913 was Paul Beecher Blanshard, who was awarded first honors in the State, the Interstate, and the National contests.

Peace Testimonial.—The students who receive first and second honors at the National Contest are awarded \$100 and \$50, respectively. Testimonials of \$75 and \$50 for the first and second honor men are also provided for the Michigan Intercollegiate Peace Contest.

HAMILTON CONTEST

The Hamilton Club, of Chicago, extends invitations to five western universities to send representatives to compete in an oratorical contest to be held in Chicago in April each year. The University of Michigan is included in this invitation. Orations are limited to sixteen minutes each and must be on governmental or sociological problems. Prizes of \$100 and \$50 respectively are offered for first and second honors.

CENTRAL DEBATING LEAGUE

The Central Debating League is composed of the debating associations of the University of Michigan, Northwestern University, and the University of Chicago. Its purpose is to discuss, in public, leading questions of the day, and in this way to develop ready and useful speakers.

The men who represent the University of Michigan in the Central League contests are chosen at the Annual Inter-department debates, held the week before Thanksgiving. The men chosen for the debates of 1914 were Louis Dudley David, Sylvan Solomon Grosner, Lyman Spaulding Hulbert, Karl John Mohr, Werner William Schroeder, and Paul Samuel Witting.

Olds Testimonial.—Mr. R. E. Olds, of Lansing, provides for 1913-1914, \$300, to be awarded in equal amounts of \$50 as testimonials to the six students who shall represent the University in the Inter-collegiate debates.

Alger Medals.—As a memorial to the late Senator Russell A. Alger, who established the Alger Medals, Mrs. Alger contributes annually the sum of \$75 for the purpose of furnishing appropriate medals for the Honor Debaters of the University. The medals are awarded to the six men who appear in the intercollegiate debates.

CUP DEBATE

In May, 1898, the Detroit Alumni Association presented the University Oratorical Association with a silver loving cup, and requested that it be competed for annually by the Alpha Nu and Adelphi Societies in the Department of Literature, Science, and the Arts, and the Webster and Jeffersonian Societies in the Department of Law. The society which wins the cup the greatest number of times in twenty years is to hold it as a permanent trophy. The annual cup debate is held the third Friday in May. In these contests students who have previously won a University honor in debate, or who have been members of a winning cup team, are ineligible to compete. In 1913 the cup debate was won by the Adelphi Society.

LYCEUM CLUB

The Lyceum Club was organized in 1908 by the department of oratory to give advanced students in oratory experience on the lecture platform. During the past five years over two hundred lectures have been given in Michigan towns. The members of the club receive nothing but expenses for their services, their object being self-development. This enables many communities to enjoy the social and educational advantages of a lecture course without the usual financial burdens.

LECTURE COURSE

In addition to the local and intercollegiate contests in debate and oratory offered on its course, the Oratorical Association provides each year, at a low price of admission, a short but attractive course of lectures and readings, with the special end in view of fostering and developing a strong interest in the art of public speaking in the University community.

OTHER UNIVERSITY ORGANIZATIONS

Women's League.—The Women's League, an organization of six hundred or more women, made up of undergraduates, wives of members of the Faculties, and alumnae, was organized in 1890 for general helpfulness to the women students. At the opening of college, committees from the League meet trains and assist the Dean of Women in helping young women in every way, and especially in finding suitable rooms. The League serves also as an employment bureau, and in general aids in shaping wisely the social life of the women.

Choral Union.—The Choral Union is an organization of students and others, for study and practice of choral music under the direction of the professor of music in the University, and for the promotion of general musical culture. It is one of the largest student musical organizations in the world. Under the auspices of the University Musical Society* the following course of concerts, known as the Choral Union Series, is announced for the year 1913-1914.

- I. November 3, 1913, Mme. Margarete Matzenauer, Song Recital.
 - II. December 9, 1913, Philadelphia Symphony Orchestra.
 - III. January 23, 1914, Choral Union Concert, Lucile Stevenson;
Soprano; Marion Green, Baritone.
 - IV. February 18, 1914, Carl Flesch, Violin Recital.
 - V. March 2, 1914, Ignace Paderewski, Piano Recital.
-

* The University Musical Society is a body corporate under the laws of the State of Michigan. It has no organic connection with the University, though its membership is restricted to past and present University officers and students. Its Board of Directors include several heads of departments in the University, and many of the most successful University administrators. It is under the direct conduct of the University Professor of Music. This insures the application of university standards in instruction, and wise financial administration. This society has established the University School of Music in Ann Arbor, in which systematic instruction is given in vocal and instrumental music, such as the University cannot undertake to provide. The conditions under which University credit may be obtained for work in the School of Music may be ascertained by conference with the Professor of Music. A series of eight chamber concerts is included in its annual programme, besides four symphony concerts, a series of historical recitals and frequent recitals by members of the Faculty and advanced students. Catalogues of the school can be had by applying to Professor A. A. Stanley.

HILL AUDITORIUM, MAY 13, 14, 15, 16, 1914.

TWENTY-FIRST ANNUAL MAY FESTIVAL,

Organizations.

The Chicago Symphony Orchestra, Founded by Theodore Thomas.

The University Choral Union.

Supplementary Children's Chorus.

Wednesday Evening—Miscellaneous Concert. Alma Gluck, Soprano soloist. Frederick Stock, Conductor.

Thursday Evening—"Messiah"—Haendel. Inez Barbour, Soprano; Margaret Keyes, Contralto; Lambert Murphy, Tenor; Henri G. Scott, Bass; Soloists. Albert A. Stanley, Conductor.

Friday Afternoon—Children's Program. "Into the World"—Benoit. Riccardo Martin, Tenor, Soloist. Albert A. Stanley and Frederick Stock, Conductors.

Friday Evening—Miscellaneous Concert. Pasquale Amato, Baritone, Soloist. Frederick Stock, Conductor.

Saturday Afternoon—Organ Recital. Earl V. Moore, Organist. Inez Barbour, Soprano, and Margaret Keyes, Contralto, soloists.

Saturday Evening—"Caractacus"—Elgar. Florence Hinkle, Soprano; Margaret Keyes, Contralto; Lambert Murphy, Tenor; Reinold Werrenrath, Baritone; Henri G. Scott, Bass; Soloists. Albert A. Stanley, Conductor.

The Columbian Exposition Organ, presented to the University by the University Musical Society, and now known as the Frieze Memorial Organ, in memory of the late Professor Henry Simmons Frieze, is used in this course of concerts.

Philological Society.—The Philological Society is an association of all members of the faculties in the departments of the ancient and modern languages, together with such advanced students in these departments as may be proposed by faculty members for election to it. The society holds regular meetings, at which papers embodying the results of original research are read and discussed. Occasionally lecturers are secured from other universities.

Deutscher Verein.—The Deutscher Verein is an organization whose members are elected upon recommendation from students in German, who have completed Courses 1 to 4 inclusive, or their equivalent. Its purpose is to bring together in a social way those students who are pursuing German courses of an advanced grade, to cultivate thus a facility in the use of the language, to stimulate a deeper interest in contemporary German literature, culture, and life and to establish an *esprit de corps* among future teachers of the language in the state. Occasional lectures are given. Its members also present one or more standard German plays each year.

Cercle Dramatique Francais.—In connection with the French Department, the Cercle Dramatique Français offers students an opportunity to improve their pronunciation and their general knowledge of the language through the thorough study and presentation of French dramatic masterpieces. The club is composed of active, associate, and honorary members. All associate members are eligible to active membership upon the recommendation of a committee composed of the Director and three student members appointed by the president of the club. Aside from the dramatic performances, the Cercle seeks to further the interest of the French language, literature, and life by weekly lectures given by members of the French department and by distinguished men of letters from abroad.

Other Organizations.—Other organizations of various nature and purposes exist among the faculty and the student body, which cultivate other interests of the University life not so closely connected with the work of any special department.

The students of the Department of Law arrange annually for a celebration of Washington's birthday.

ADMISSION TO THE UNIVERSITY

The requirements for admission to the various Departments of the University are given in detail in the pages of the Calendar devoted to those Departments.

APPROVED HOMES FOR WOMEN

Since in the judgment of the University authorities it is deemed wise that men and women room in different houses, all undergraduate women in the University are required to communicate with Mrs. Myra B. Jordan, Dean of Women, and to obtain her approval of their selection, before engaging rooms. Changes in rooming place may be made only with the approval of the Dean of Women. A list of houses where only women are taken may be obtained from Dean Jordan by writing at any time after July 1.

A large number of women can be accommodated in houses under the jurisdiction of the Woman's League and supervised by the Dean of Women. All freshmen women are required to live in these houses, in each of which also reside a certain number of responsible upperclass women. These houses are supplied with parlors, and a distinct effort is made to develop in each group wholesome responsibility and ideals. Applications should be made to Dean Jordan, as stated in the preceding paragraph.

THE HEALTH OF STUDENTS

The University attempts to conserve the health of students and to provide that those who are taken sick may have proper attention. Any student may select his own physician, or he may avail himself of the services offered him by the University. Both hospitals are open to sick students at any time. Those not seriously sick may apply at the outdoor department, while those more seriously affected may find beds in the Hospitals. Here there is no charge for services, but students, like other patients, must pay for room and board, the price varying with the kind of accommodations furnished, from \$7 per week upward. Women students desiring special examination at the hospital are advised to consult with the Dean of Women concerning the matter, and she will arrange that proper attention may be given, without embarrassment.

Every student taking work in either of the gymnasiums undergoes a thorough physical examination, and those in whom physical defects are detected are referred to specialists in the medical schools, who give to such students advice and treatment free of charge. The training in the gymnasium is so arranged as to remedy, as far as possible, physical defects. Work in the gymnasium is obligatory for all first year students in the Departments of Literature, Science, and the Arts, and of Engineering. Consequently, all those students have the privilege of such an examination and advice, if needed, free of charge. Medical students, on account of more frequent exposure to infection, are expected to undergo a physical examination once during each semester of the four years. Any student in any class may have a physical examination on application, and at an appointed time, at either of the hospitals.

The Dental Clinics are open to students, the only charge being for material used. All are advised to have their teeth examined at least once a year.

The water supply of Ann Arbor is examined ordinarily every two weeks, both chemically and bacteriologically, and when it is under suspicion these examinations are made weekly, and sometimes daily, and the student body is informed of the condition of the water when such need arises, by means of bulletins posted about the campus. Since the public water supply was introduced in 1885 no student has been known to contract typhoid fever from this source, with but one exception. In 1894 the water became suddenly infected, and five cases of typhoid fever resulted, but these were mild and the source of infection was promptly detected and removed. On the slightest suspicion of infection of the water supply, students are advised to drink only boiled water until the source of contamination has been found, and the water proved to be free from danger.

The air of class rooms and assembly halls is examined both chemically and bacteriologically from time to time, and in this way failure of ventilation is detected and reported.

Students are earnestly recommended to select their rooms with care, and with special reference to hygienic conditions. All rooms should be so arranged as to admit of free ventilation, and it is well to have a study room and bed room, the latter not to be heated either by day or night, but to be freely exposed from wide open windows to the outdoor air.

The food supply of clubs, fraternities, and sororities is examined free of charge at the Hygienic Laboratory at any time.

Cases of infectious disease likely to injure the health of others are excluded from class rooms and from University attendance. In case of threatened smallpox the University offers free vaccination to all students, but those who neglect vaccination and become infected with the disease are subject to such disposition as the Health Officer of the city may direct.

Examination of sputum will be made for any student in actual attendance at the University, at the Hygienic Laboratory, at any time, free of charge. Anyone who has a cough which continues for a week or longer should take the sputum to the laboratory and have it tested.

Students are expected to obey the rules and regulations formulated by the University Committee on Sanitation. Failure to comply with these rules and regulations will be investigated, and may lead to discipline.

A course of lectures on General Hygiene is required of medical students, and is open to students from every department. These lectures extend through one semester, three times a week, and are attended usually by from 300 to 400 students. Special instruction along the lines of sex hygiene is given to all students, men and women separately.

UNIVERSITY HEALTH SERVICE

The University attempts to conserve the health of students and to provide that those who become ill may receive proper medical attention. For this purpose a University Health Service has been established with headquarters at 226 South Ingalls Street, where a staff of physicians consult with men students during the morning hours, and at other times by special appointment. Women students may consult a woman physician during the afternoon hours and by special appointment. Advice is given, medicines dispensed, and examinations made at the office without charge. Students sent by a University Health Officer to one of the University hospitals will receive treatment free of charge for a period up to sixty days. If a student desires the aid of the University physicians at his room, a charge of \$1.00 for a day call and \$2.00 for a night call is made. To prevent loss of time, appointments will be made for students who need the aid of specialists at the hospitals.

A physician from the University Health Service will be in attendance upon the Bogardus Engineering Camp and the Biological Station.

All students of the Summer Session are required to pay at the time of registration a fee of fifty cents for this service. Beginning with the Summer Session of 1915, this charge will be one dollar.

ATTENDANCE AND DISCIPLINE

The State of Michigan extends the privileges of the University, with only moderate charges, to all persons of either sex who are qualified for admission. Thus it does not receive patronage, but is itself the patron of those who seek its privileges and its honors. It cannot, however, be the patron of idleness or dissipation. Its crowded classes have no room except for those who assiduously pursue their studies of their choice, and are willing to be governed in their conduct by the rules of propriety.

Students not in their places at the opening of the semester must present written excuses from their parents or guardians for the delay.

Such delinquencies as tardiness, absence, deficiencies, and offences against good order, in the several departments of instruction, are ordinarily dealt with by the Administrative Officers of the Departments in which the student is enrolled. Flagrant cases are reported to the Faculty for adjudication.

Students are suspended or dismissed whenever, in the opinion of the Faculty, they are pursuing a course of conduct seriously detrimental to themselves or the University.

The following is a By-law of the Board of Regents:—

“Whenever any faculty is satisfied that a student is not fulfilling, or likely to fulfill, the purpose of his residence at the University, or is for any cause an unfit member thereof, the President shall notify his parents or guardian, that they may have an opportunity to withdraw him, and if not withdrawn within a reasonable time, he shall be dismissed.”

RELATION OF STUDENTS TO CIVIL AUTHORITIES

Students are temporarily residents of the city, and, like all other residents, are amenable to the laws. If guilty of disorder or crime, they are liable to arrest, fine and imprisonment. A rule of the University Senate provides that if a student is arrested, or is convicted of any offense by the civil authorities, he shall be cited to appear before the Faculty of the Department in which he is matriculated, and shall be liable to suspension or expulsion.

STUDENT ORGANIZATIONS AND INTERESTS

While matters of scholarship and general conduct are looked after by the faculties and administrative officers of the different Departments, all other student enterprises and organizations are under the supervision of two general committees,—The Senate Committee on Student Affairs and the Board in Control of Athletics. By the formal action of the Board of Regents, the accounts of all student organizations, are subject to the approval of the Auditor and Comptroller of Student Organizations, and must be presented to him for audit at least once each year, and as often as he shall require.

The Committee on Student Affairs has jurisdiction over the establishment of student organizations and the management of their affairs and the launching of new enterprises and activities including entertainments of various sorts and determines the eligibility of students to take part in these activities, as well as to hold offices. The authority of this committee is derived from the University Senate and extends to all non-athletic activities and to all students in every Department of the University. Activities of various types are supervised directly by appropriate sub-committees, while the question of eligibility to participate in any non-athletic activity is under the immediate charge of the Sub-Committee on Eligibility. The Rules governing eligibility, which have been approved by the Senate, and which apply equally to all Departments of the University, are given below.

RULES GOVERNING PARTICIPATION IN PUBLIC ACTIVITIES

*Publ. Activities.** Public activities includes:—(1) Participation in any oratorical or debating contest, or any dramatic or musical exhibition, (2) Service on student publications, (3) Holding a Class or University Office, (4) Official connection with any of the so-called college functions, such as the Sophomore Prom, Women's Banquet, and similar activities. The list is not intended to be exhaustive, but merely to indicate the character and scope of the activities referred to.

II.

Eligibility. Students desiring to take part in any public activity, or in the preparation of such activity, must, *before* such participation, or preparation, obtain from the Chairman of the Sub-committee on Eligibility of the Senate Committee on Student Affairs an official certificate of eligibility. Application cards for such certification must be produced from the Chairman or Secretary of the Senate Committee or the Chairman of the Sub-committee on Eligi-

* "Participation" is to be interpreted as including specific preparation for any public activity or management thereof.

bility, and when signed by the Secretary of the Department to which the student belongs, filed with the Chairman of the Sub-committee on Eligibility. This Chairman, upon favorable action by his committee, will issue the official certificate of eligibility. No student may engage in any public activity until such official certificate is filed with the proper officer in charge of that activity.

III.

Probation. Students on probation are forbidden to take part in any public activity.

IV.

Warning. Students on the warned list are forbidden to participate in any public activity.

V.

Conditions and Failures. Students having outstanding conditions or failures are prohibited from participating in any public activity except by special permission from the Senate Committee on Student Affairs. In general a grade of D will be considered as a condition.

VI.

Special Students. Special students are prohibited from participating in any public activity except by special permission of the Senate Committee on Student Affairs.

VII.

First Year. No student shall take part in any public activity during his first year of residence in the University, except by special permission of the Senate Committee on Student Affairs. This shall not exclude such students without conditions and otherwise in good standing, from participating in the public activities of their class.

VIII.

General. The Senate Committee on Student Affairs has the right to prohibit a student from participating in any public activity whenever, in the opinion of the Committee, such participation is detrimental to his college work.

IX.

Special Permission. The special permission to participate in public activities in exception to Rules V, VI, and VII, will be granted by the Senate Committee on Student Affairs only upon the positive recommendation of the Faculty of the Department to which the student belongs. Petitions for such special permission must in every case be presented before the participation in the activity is begun.

FELLOWSHIPS, SCHOLARSHIPS, LOAN FUNDS, AND PRIZES*

Ten University Fellowships with a value of three hundred dollars each, have been established by the Board of Regents. These fellows are enrolled as students in the Graduate School and in addition to their studies, are liable to render service to the University to the extent of not more than four hours a week. (For further details see Graduate Department). For year 1913-1914 the holders of these fellowships are Ernest Franklin Barker, A.M., Physics; Suzan Rose Benedict, A.M., Mathematics; Dorothy Miles Brown, A.B., Economics; Leroy Melville, Coffin, M.S., Mathematics; Joseph Edgar DeCamp, A.M., Psychology; Charles Wallace French, A.B., Latin; Jacob Burrus Munn, A.B., History; Floyd Benjamin Streeter, A.M., History; and Alvalyn Eunice Woodward, M.S., Zoology.

Five University Fellowships of five hundred dollars each have also been established on the same terms. For 1913-1914 the holders of these fellowships are Robert Lee Jickling, B.S., Organic Chemistry; Carlton Volney Kent, M.S., Physics; Gilbert Hawthorne Taylor, A.B., Latin; Hessel Edward Yntema, A.M., Political Science; and Mary Yost, A.M., Rhetoric.

Ten State College Fellowships of three hundred dollars each have been established by the Board of Regents on similar terms to the University Fellowships. The candidates are nominated by the faculties of ten colleges in the State of Michigan. For 1913-1914 the holders of these fellowships are Richard Elwood Bissell, B.S., Mechanical Engineering, (Michigan Agricultural College); George Kendall Ferguson, B.S., Mathematics, (Kalamazoo College); William Vernor Hoyt, A.B., Chemistry, (Olivet College); Arthur Hiram Jones, A.B., Economics, (Hillsdale College); Albert Eugene Lampen, A.B., Mathematics, (Hope College); Ivan Packard, A.B., History, (Albion College); Will Carl Rufus, A.M., Astronomy, (Albion College); Claud Webster Satterlee, B.S., Mathematics, (Alma College); Verna Charlotte Shultz, A.B., German, (Hope College); and Helen Louise Wolcott, A.B., English, (Adrian College).

Buhl Classical Fellowship.—Mr. Theodore D. Buhl, of Detroit, has generously continued his provision for two Classical Fellowships for the year 1913-1914 with an income of two hundred and fifty dollars each. For the current year the holders of the Fellowships are: Robert Walker Adkisson, A.B., and William Vance McCay, A.M.

* The most of the funds here mentioned are restricted in use to the Department of Literature, Science, and the Arts, and the Graduate Department, though some of them are also available in other Departments of the University.

George S. Morris Fellowship in Philosophy.—Provision for a Fellowship in Philosophy with an income of four hundred dollars, was continued by Mrs. George S. Morris. For the year 1913-1914 the holder of the Fellowship is William Edward Bingham, B.D.

Angeline Bradford Whittier Fellowships in Botany.—These Fellowships have been established in memory of his mother by Joseph Bradford Whittier, of Saginaw. The principal sum of the endowment is four thousand dollars.

Fellowships in Gas Engineering.—The Michigan Gas Association continues for the year 1912-1913 the support of the Fellowship in Gas Engineering which it has maintained since 1900-1901. The annual stipend is five hundred dollars. In September, 1911, the Association authorized the establishment of a second fellowship amounting to three hundred dollars annually. By the terms of the gift the course of study is in charge of the heads of the departments of instruction in the chemical engineering and mechanical engineering. The holder of the fellowships for the current year are Carl Kingsley Wirth, B.Ch.E. and Robert Hamilton Tennant, B.Ch.E.

Charles James Hunt Fellowship.—In July, 1900, Mr. Charles James Hunt, of Detroit, a graduate of the University of the Class of 1846, and wife, conveyed by deed, to the Board of Regents, in trust, the title to certain pieces of real estate, subject to Mr. Hunt's life-interest in the income to be derived therefrom, and to the life-interests of other persons named in the deed. After the terminations of these life-interests "one or more fellowships in the University of Michigan" are to be established in accordance with conditions named in the deed of trust and in accompanying documents, and are to be known as the Charles James Hunt Fellowships.

Emma J. Cole Fellowship in Botany.—In 1910 Miss Emma J. Cole bequeathed to the University the residue of her estate, the proceeds to be used for the establishment of a fellowship in Botany.

The holder of the Fellowship for 1913-1914 is John Henry Ehlers, A.B.

Boyer Fellowships in Transportation.—In July, 1911, Mr. Joseph Boyer gave to the University a sum to be used for the support of a technical course in Railway Transportation. With a portion of this sum a fellowship to the amount of four hundred fifty dollars and a scholarship to the amount of two hundred twenty-five dollars have been established.

Carl E. Schmidt Fellowship in Tanning.—In September, 1911, Mr. Carl E. Schmidt gave to the University, a sum of money for the establishment of a fellowship in the science and art of tanning, amounting to six hundred dollars annually, together with a further sum to go for needed equipment and apparatus. The holder of the Fellowship for 1913-1914 is Anton A. Schlichte, M.S.

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Acme White Lead and Color Works Fellowship.—The Acme White Lead and Color Works, of Detroit, has given a fellowship to the value of five hundred dollars for the study of the protection of concrete and stucco from disintegration. The holder of the Fellowship for 1913-1914 is John Crowe Brier, M.S.

Mather Classical Fellowship.—In May, 1913, Mr. William G. Mather, of Cleveland, Ohio, gave the sum of \$300 for the establishment of a chemical fellowship for the year 1913-1914. The holder of this Fellowship is James Eugene Dunlap, A.B.

Carl Braun Fellowship.—In December, 1913, Mrs. Elise L. Braun, of Toledo, Ohio, gave to the University the sum of ten thousand dollars, the proceeds of which are to be used for the establishment and maintenance of a fellowship to be known as the Carl Braun Fellowship.

Phillips Scholarships.—The late Henry Phillips, Jr., of Philadelphia, Pa., made provision in his will for the establishment and maintenance of six scholarships, to be known as the Phillips Scholarships, in the Department of Literature, Science, and the Arts of the University of Michigan. By the terms of the will these scholarships are to be given only to candidates for the degree of Bachelor of Arts, who excel in the Greek and Latin studies required for admission to the University; and they are to be awarded by a committee consisting of the President of the University, the Dean of the Department, the senior professor of Greek, and the senior professor of Latin.

Of the six scholarships contemplated in the bequest, three have been established, with an income of fifty dollars each. They are awarded to students, otherwise properly qualified, who by special examinations show that they excel in the requirements for admission in Greek and Latin. The examination covers the ground included in two units of Greek and four units of Latin (see page 103). In 1913 one of these scholarships was awarded to Ralph Moore Carson.

In 1913 the examination will be held on Saturday, October 26, and will be open only to students already admitted to the freshman class. Application for admission to this examination must be made to the Dean of the Department on or before October 17, 1914.

Lucinda Hinsdale Stone Memorial Scholarship.—The Michigan State Federation of Women's Clubs has presented to the University the sum of three thousand dollars, as a portion of a fund to be known as the Lucinda Hinsdale Stone Supplementary Loan Scholarship Fund, the income of which is to be administered by the President of the University, the Dean of Women, and a third person of their appointment (who shall be a woman), for the benefit of women who are students in the University. On an average three young women each year have been assisted by the income from this fund.

Detroit High School Scholarships.—The alumni of the Detroit High School have established several scholarships open to graduates of that school. The first steps toward raising a fund for this purpose were taken in 1891; and a corporation has since been formed under the title of the Detroit High School Scholarship Fund Association.* From four to six students at a time usually enjoy the benefit of the fund. Several of the beneficiaries have received degrees at the University. One of the scholarships is known as the Mary C. Leete Memorial Scholarship, in memory of a teacher who died in 1894.

Saginaw High School Scholarships.—Four Scholarships, with an annual income of two hundred and fifty dollars each, established by the Honorable Arthur Hill, of Saginaw, W. S., and known as the John Moore, the Wells-Stone, the Alonzo R. Bingham, and the Otto Roeser scholarships, are open to graduates of the Saginaw, W. S., High School.

The Saginaw, E. S., High School offers several scholarships of varying amounts to deserving graduates of that school. One of these is known as the Heavenrich Brothers & Co.'s Scholarship, and is provided by the mercantile firm of that name. Another, designated as the High School Scholarship, is cared for largely by the High School Lyceum. A third is known as the A. R. Loveland Scholarship. The graduating class of 1900 also made provision for a scholarship to be available every sixth year. These scholarships are all administered as loan funds.

Grand Rapids High School Scholarships.—The High School Scholarship Association of Grand Rapids is a body incorporated under the State Law, for the purpose of assisting graduates of the Grand Rapids High School to secure a college education in the Department of Literature, Science, and the Arts, or the Department of Engineering, of the University of Michigan.

Perry Scholarship Fund.—The Alumni Association of the Ann Arbor High School, in 1898, established a fund, in memory of Walter Scott Perry, graduate of the University in the class of 1861, and for twenty-seven years Superintendent of the Ann Arbor schools.

The purpose of the fund is to assist graduates of the School in procuring an education in the Department of Literature, Science, and the Arts of the University of Michigan. It is administered as

* The State Legislature in 1893 passed an act providing "that five or more persons of full age, residing in the State of Michigan, may associate and in corporate themselves together for the purpose of establishing scholarships in the University of Michigan, for the benefit of graduates of the high schools of the State." A corporation organized in accordance with the provisions of this act "shall under the general management of not less than five, nor more than fifteen trustees," and "shall, in law and equity, be capable of taking and receiving real and personal estate....not exceeding one hundred thousand dollars in the aggregate, for the purpose of its incorporation."

a Loan Fund,* repayments to be made by beneficiaries under regulations prescribed by the Board of Directors of the High School Alumni Association.

Saginaw Valley Alumnae Association Scholarship Fund.—The Saginaw Valley Alumnae Association in 1904 established a fund for the aid of undergraduate women in the Department of Literature, Science, and the Arts. The fund is administered as a Loan Fund under the direction of the Dean of Women and representative Alumnae.

Seth Harrison Scholarship Fund.—The Seth Harrison Scholarship Fund was established in memory of her father, by Mrs. Clara Harrison Stranahan, of Brooklyn, N. Y. The principal of the fund was originally twenty-five thousand dollars, but this has been increased by additions from unexpended income. The income is to be used, on conditions specified in the covenant between Mrs. Stranahan and the Board of Regents, for the benefit of descendants of Seth Harrison who may be pursuing studies in the Department of Literature, Science, and the Arts of the University of Michigan, whenever applicants properly qualified present themselves. Provision is made, however, for applying the income of the fund to scholarships for other persons, "if at any time there shall be a period of seven years during which there are no qualified applicants," descendants of Seth Harrison.

Margaret Smith Hunt Scholarships, James B. Hunt Scholarship, and Charles James Hunt Scholarship.—In July, 1900, Mrs. Margaret Elsie Hunt, of Detroit, a student in the University in the year 1878-9, conveyed by deed to the Board of Regents, in trust, the title to certain pieces of real estate, subject to Mrs. Hunt's life interest in the income to be derived therefrom. After the termination of this life-interest, "one or more scholarships in the undergraduate course of studies in the Department of Literature, Science, and the Arts," are to be established in accordance with conditions named in the deed of trust and in accompanying documents, and are to be known as the Margaret Smith Hunt Scholarships.

In February, 1902, Mr. and Mrs. Hunt conveyed by deed to the Board of Regents, in trust, the title to a certain other tract of land, subject to Mrs. Hunt's life-interest in the income to be derived

* In 1899 an act was passed by the State Legislature containing the following provisions: "Any five or more persons of full age residing in the State of Michigan may associate and incorporate themselves together for the purpose of establishing loan funds for the benefit of school scholars and students of this State, to assist them to attend the University of Michigan" (and other State educational institutions). "All the funds received by any corporation organized under this act shall be used, after paying necessary expenses, for the exclusive purpose or purposes set forth in the articles of association.... Such corporation shall in equity and law be capable of taking and receiving real and personal estate.... not exceeding twenty-five thousand dollars, in the aggregate, for the purpose of its incorporation."

therefrom and to certain other life-interests and conditions named in the deed. After the termination of these life-interests, and in accordance with conditions named in the deed of trust, and in accompanying documents, a portion of the income derived from the trust is to be devoted to the maintenance of the James B. Hunt Scholarship, so named in memory of the father of Charles James Hunt; a second portion to the maintenance of a scholarship, to be known as the Charles James Hunt Scholarship; and the remainder to the maintenance of Margaret Smith Hunt Scholarships in addition to those previously provided for.

W. W. Wedemeyer Scholarship.—The Class of 1894 established a fund, the income of which is "to be used as a loan fund for the benefit of needy and worthy undergraduates in the Literary Department," on condition that the Board of Regents "shall require of such student or students as may receive the benefit of such fund a promise to repay to said Board the sum loaned on such terms as shall seem to said Board to be reasonable; it being the intention of the donors of said fund that the same shall be kept intact, as far as possible.

In February, 1913, at the request of the donors the fund was named the W. W. Wedemeyer Scholarship Fund, in memory of the late Hon. W. W. Wedemeyer, an honored member of the Class of 1894.

Scholarship of the Class of 1897.—The Class of 1897 has established a fund, a portion of which is available as a loan fund.

Scholarship of the Class of 1898.—The Class of 1898 has established a scholarship fund, the proceeds of which are not yet available.

Scholarship of the Law Class of 1899.—A small sum, contributed by members of the Law Class of 1899, is available as a loan fund.

Students' Lecture Association Fund.—Under the condition of the gift made to the Board of Regents by the Students' Lecture Association, a small fund is available for loan to students in any Department of the University. All loans are to be made through a committee consisting of the President of the University, the Dean of the Department of Literature, Science, and the Arts, the Dean of the Department of Medicine and Surgery, and the Dean of the Department of Law, and they are to be secured by note payable one or more years after the borrower has completed his university course.

Newton Van Der Veer Loan Fund.—In January, 1900, the Regents accepted from Mrs. George Wagner a sum of money as the nucleus of a fund to be known, in memory of her father, as the Newton Van Der Veer Loan Fund; and to be used in loans "to needy students in such amounts and under such conditions as the executive head of the University may deem proper and wise,"

Detroit Collegiate Alumnae Fund.—In March of 1907 the Detroit Branch of Collegiate Alumnae established a fund for the aid of undergraduate women in the University. This fund is administered as a loan fund under the direction of the Dean of Women and representative Detroit Alumnae.

Ann Arbor Collegiate Alumnae Fund.—The Ann Arbor Branch of the Association of Collegiate Alumnae has established a fund for the aid of undergraduate women in the Department of Literature, Science, and the Arts. This fund is administered as a loan fund under the direction of the Dean of Women and a committee of Alumnae.

Webster Loan Fund.—In February, 1909, the Regents accepted from Mr. John R. Webster and his son, Mr. John P. Webster, a sum of money for the foundation of a scholarship. It is administered as a loan fund.

Alice Freeman Palmer Scholarship.—The Alumnae of the University are trying to raise five thousand dollars to endow this scholarship, and a considerable sum has already been paid in to the University Treasurer.

Joseph A. Bartholomew Scholarship.—The late Joseph A. Bartholomew, bequeathed to the University of Michigan property on the income of which is to be established a scholarship of the value of five hundred dollars annually.

Anna M. Chandler Scholarship Fund.—The Alumni of the Marquette, Michigan, High School have given to the University the sum of one thousand dollars to be known as the Anna M. Chandler Loan Fund, in honor of Miss Anna M. Chandler, A.B., 1874, for thirteen years superintendent of schools of Marquette. The money is administered as a loan fund, preference being given to graduates of the Marquette High School.

The Henry Strong Scholarships.—The heirs of the late Henry Strong, of Lake Geneva, Wis., have established in memory of their father, three scholarships of the value of two hundred fifty dollars each. These scholarships are held during the year, 1913-1914 by Bernice Merle Hannan, Irene Litchman, and Fred Sophur Sorrenson, A.B.

The James L. Babcock Scholarship Fund.—The late James L. Babcock, of Ann Arbor, Michigan, bequeathed to the University the sum of five thousand dollars in trust, to be loaned out and kept at interest, said interest to be used annually and perpetually to help educate a worthy young man or worthy young woman as the case may be. The income, known as the James L. Babcock Scholarship Fund, is administered by the President and Secretary of the University and the Professor of Music in the Department of Literature, Science, and the Arts; and is awarded each year to a student who is especially interested in music and who desires to elect work in the department of Music. The student selected must, in addition to being especially interested in the subject of music, have attained at

least an average standing in other subjects at the University, and if, during any year, no candidate meeting the conditions can be found, the income from the fund is added to the principal.

The holder of the Fellowship for the current year is Marten TenHoor, A.B.

Good Government Club Prize.—The income of the sum of five hundred dollars, presented to the Board of Regents by the Good Government Club of the University, is available, under the conditions of the gift, as a prize "for the best essay on some theme connected with the subject of good government." The professor of Political Economy, the Dean of the Department of Law, and the professor of History are a committee to choose themes for the essays and to award the prize.

The Todd Prizes.—Honorable A. M. Todd, of Kalamazoo, Michigan, offers to the students of this University two prizes of one hundred dollars each for the best essays on certain specified political, governmental, and sociological themes.

These prizes may be competed for by students enrolled in any Department of the University, who have taken an academic degree here or at any other reputable college or university, and by undergraduate students of any Department whose record indicates that they will probably graduate from their Department in 1913 or 1914. No student is allowed to compete for more than one of the prizes. The essays should not be unduly expanded. Each writer should sign his essay with an assumed name or motto and should send in with it, in a sealed envelope, his real name and his home address, placing the assumed name or motto on the outside of the envelope. He should deposit the essay with the President of the University on or before May first, 1914.

The Field Poetry Prize.—A prize of one hundred dollars has been offered each year since 1909 by Mr. Nelson C. Field, of Kansas City, for the best written poem by an undergraduate. Poems for this competition should be sent to the head of the Department of Rhetoric not later than May 1.

Michigan Menorah Society Prize.—Mr. Julius Rosenwald, of Chicago, Illinois, has given to the University of Michigan an annual sum of one hundred dollars, to be awarded as a prize for an essay by an undergraduate of the University of Michigan, on a topic dealing with the literature, the history and the achievements of the Jewish people. He has offered this prize with a view of stimulating a general and intelligent interest in a field which promises so well for the disclosing of one of the sources of our modern civilization, the Hebraic, the other being the Hellenistic. The prize is known as the "Michigan Menorah Society Prize," a society organized at the University for the study of Hebraic culture and ideals, which Mr. Rosenwald desires to encourage.

The award is made by a committee of three, appointed by the

President of the University, one member, however, to be nominated by the Michigan Menorah Society.

The award is given only for essays showing sufficient merit. In case the judges should conclude that none of the essays presented deserves recognition, the year succeeding two prizes will be offered, each in the sum of one hundred dollars. If two essays should be of equal merit, the judges may divide the prize equally, awarding to each essay the sum of fifty dollars.

Advertising Competition Prize.—In January, 1914, a donor, who preferred that his name should not be made public, tendered to the University the sum of five hundred dollars annually for three years, to be used as prizes in an advertising competition, open to all students in the University. The administration of this prize is in the hands of the Committee on the courses in journalism, of which Professor F. N. SCOTT is chairman.

FEEES AND EXPENSES

All Fees Must be Paid in Advance or at the Time of Registration.—A by-law of the Board of Regents provides that no student or graduate shall be allowed to enjoy the privileges of the University until he has paid all fees that are due. The matriculation and annual fees must be paid in full at the time of registration. The laboratory fees and other special fees are payable at or before the time of enrollment in the class. The graduation fee and the teacher's diploma fee must be paid before the candidate is recommended by the faculty. Those graduating or taking a teacher's diploma on Commencement Day must pay the required fee on or before a fixed date preceding Commencement Day, which date will be posted in due season by the Secretary. Holders of fellowships or of scholarships are required to pay the matriculation fee (if not already paid), the annual fees, graduation fee, laboratory expenses, and other similar charges, the same as the other students of the Department in which their work lies.

In view of the fact that no variation can be made from the rule that all fees are due and payable in advance, no prospective student should come to Ann Arbor for registration without a sum sufficient to cover all his fees.

Residence.—*The burden of registering under proper residence is placed upon the student*; and it is the duty of each student at registration, if there be any possible question of his right to legal residence in Michigan, *under the rules of the Regents*, to raise the question with the registration officer and have such question passed upon and settled by the proper officers of the University, previous to registration. Any student who registers improperly under this

rule shall, when discovered, be required to pay not only the proper non-resident fees but shall be assessed as an addition to the annual fee for that year, the sum of \$10.

Matriculation Fee.—Every student, before entering a Department of the University, is required to pay a matriculation fee. This fee, which, for citizens of the United States, legally resident in Michigan, or their wards, is ten dollars, and for others, twenty-five dollars, is paid but once, and entitles the student to the privileges of permanent membership in the University. Aliens who have their first naturalization papers will be regarded as citizens of the United States.

Annual Fees.—(See also "Fee for Second Semester.") In addition to the matriculation fee, every student has to pay an annual fee for incidental expenses, and, in some Departments, a small additional fee for special purposes. These fees are paid the first year of residence at the University, and every year of residence thereafter. Resident graduates are required to pay the same annual fees as undergraduates. The annual fees in the several Departments of the University are as stated below. By "Michigan students" is meant those who are citizens of the United States, legally resident in Michigan, or their wards.

Department of Literature, Science, and the Arts: for Michigan students forty-two dollars; for all others, fifty-two dollars. Students in this Department who are pursuing a combined course, and, in consequence, are registered at the same time in one of the professional Departments are required to pay the annual fee due from students in such professional Department instead of the annual fee of the Department of Literature, Science, and the Arts.

Departments of Engineering and Architecture: for Michigan students, fifty-seven dollars; for all others, sixty-seven dollars. The fee required from graduate students who are granted the privilege of pursuing studies for an advanced degree *in absentia* is ten dollars for each year of registration.

Department of Medicine and Surgery: for Michigan students, fifty-seven dollars; for all others, sixty-seven dollars. The fee required for graduate students who pursue special advanced laboratory courses in this Department is, in addition to the ordinary laboratory expenses, ten dollars for each course taken.

Department of Law: for Michigan students, sixty-seven dollars; for all others, seventy-seven dollars.

School of Pharmacy: for Michigan students, fifty-seven dollars; for all others, sixty-seven dollars.

Homoeopathic Medical College: for Michigan students, fifty-seven dollars; for all others, sixty-seven dollars.

College of Dental Surgery: for Michigan students, seventy-seven dollars; for all others, one hundred seven dollars. A further charge

of ten dollars a year is made to cover the cost of certain special supplies provided by the University.

Graduate Department: for Michigan students, forty-two dollars; for all others, fifty-two dollars. The fee required from graduate students who are granted the privilege of pursuing studies for an advanced degree *in absentia* is ten dollars for each year of registration.

Fee for Part Time Students: Persons engaged in teaching in public, parochial, or private schools, who are regularly admitted as students in the Department of Literature, Science, and the Arts, or the Graduate Department, may elect not more than five hours a week, upon the payment of a fee of ten dollars in lieu of the regular annual fees. Such students must pay the matriculation fee, the same as other students, and are subject to the same rules as are all other students regarding the time of registration, etc.

Second Semester Fee.—A student who registers at the beginning of the second semester is required to pay 60% of the prescribed annual fee (see refund of fees (g) below).

Refund of Fees.—(a) No student will be entitled to a refund except after surrender to the Secretary of the University of the student's original receipt from the Treasurer of the University and the surrender of all tickets issued to such student for athletic events not yet having occurred.

(b) No refund will be made to any student expelled, suspended, or requested to withdraw on account of conduct or poor scholarship.

(c) No refund or reduction of matriculation fee is made except in case of those withdrawing within the first two weeks after registration.

(d) Any student who withdraws voluntarily and in good standing not more than two weeks after his registration shall be entitled to a refund of his entire annual fee, together with the matriculation fee.

(e) A student who withdraws thus more than two weeks and less than eight weeks after his registration is entitled to a refund of one-half his annual fee.

(f) A student who withdraws thus more than eight weeks after the beginning and not later than the end of the semester of registration is entitled to a refund of 40% of his annual fee.

(g) The 40% refunded to students enrolling at the beginning of the second semester (see "Second Semester Fee" above) shall be included in determining any further refund to withdrawing students under (d) and (e) above.

(h) A student who transfers at the beginning of the second semester from one Department to another in which the annual fee is higher shall be required to pay an additional amount sufficient to bring the total fee to that in the latter Department.

Fee for Special Entrance Examinations.—An applicant for admission to any Department of the University who presents himself for the entrance examinations at a date later than that announced in the University Calendar is required to pay the University Treasurer a fee of five dollars before he can receive permission to take the examinations.

Laboratory Expenses.—Students who pursue laboratory courses of study are required to pay for the materials and apparatus actually consumed by them. The deposits required in advance are different for the different courses, ranging from one to twenty dollars. The laboratory expenses of students vary with their prudence and economy. In the chemical laboratory the average expense for each course is about one dollar and twenty cents a week.

Demonstration Courses.—A fee of ten dollars is charged for each of the demonstration courses given in the Department of Medicine and Surgery.

Gymnasium Expenses.—A charge of two dollars a year is made for the rental of a locker in Waterman gymnasium, one dollar for a locker in Barbour Gymnasium.

Graduation Fee.—The fee for graduation is ten dollars. The by-laws of the Board of Regents prescribe that no person shall be recommended for a degree until he has paid all dues, including the fee for graduation.

Teacher's Diploma.—The fee for the Teacher's Diploma is two dollars, which must be paid in advance of recommendation.

Fees for Summer Session.—(a) In the Department of Literature, Science, and the Arts: a uniform fee of twenty dollars for the session is required of all students. (b) In the Departments of Engineering and Architecture: a uniform fee of twenty dollars for the session is required; an additional fee of ten dollars is required of all students who take the summer field work in surveying. (c) In the Department of Medicine and Surgery and in the Department of Law: the fees vary with the amount and character of the work taken. Further information is given on subsequent pages in the chapter relating to the Summer Session. University Health Service Fee, in all Departments, fifty cents; beginning with the summer of 1915, one dollar.

Other Expenses.—Students sometimes obtain board and lodging in private families for from three and a half to six dollars a week. More frequently they join clubs, in which the cost of board is from three to four dollars a week. Room rent varies from seventy-five cents to two dollars and a half or more a week for each student. The

annual expenses of students, including clothing and incidentals, are, on the average, about four or five hundred dollars. The University does not undertake to furnish manual labor to students; yet a number find opportunities in the city for remunerative labor.

The Students' Christian Association maintains at both its buildings for men and for women, employment bureaus by which during recent years about five hundred students annually have been assisted to positions in which they have earned by conservative estimate \$15,000.00. This service is at the disposal of any student or prospective student gratis, without respect to membership in the Association. The Michigan Union also maintains an efficient and useful employment bureau for men students.

There are no dormitories and no commons connected with the University. The Christian Association maintains bureaus for information regarding rooms and board, and provides other special facilities for new students. Women students should, in advance of their arrival, communicate with the Dean of Women regarding lodgings.

Department of Literature, Science, and the Arts

THE Department of Literature, Science, and the Arts owes its name to a provision in the legislative act under which the University was organized in the year 1837. Its aim is to cover the broad field of general university study of the ancient and the modern languages and literatures, of history, philosophy, mathematics, science, and the liberal arts, as distinguished from the more special work of the professional schools in engineering, medicine, law, pharmacy, and dentistry; and it offers a large number of courses of instruction, from which the student is allowed to choose such as he is qualified to pursue.

The Graduate School formerly maintained in connection with this Department has been reorganized to include graduate work throughout the University and is under the direction of a Dean and an Executive Committee.

The academic year extends from Tuesday preceding the first Thursday in October* to the last Thursday in June (September 29, 1914, to June 24, 1915).

REQUIREMENTS FOR ADMISSION

ADMISSION OF CANDIDATES FOR A DEGREE

[For admission to advanced standing, see page 113.]

[For admission of students not candidates for a degree, see page 115.]

Admission to this Department is gained only by examination (see page 110) or by certificate (see page 112). Applicants for admission as undergraduates must be

* Except in years preceding leap years, when it begins upon the Tuesday next preceding the first Wednesday in October.

at least sixteen years of age, and must have completed the requirements for admission as here described. These requirements are stated in units, a unit meaning the equivalent of five recitations a week in one branch of study for one year, amounting in the aggregate to not less than one hundred twenty sixty-minute hours in the clear. Two to three hours of laboratory, drawing, or shop-work will be counted as equivalent to one of recitation.

(A) Fifteen units are required for admission. These fifteen units must include three units of English Composition and Literature, two units of a Foreign Language, one unit of Algebra and one of Geometry, and one unit of one of the sciences, Physics, Chemistry, Botany, or Zoology; and may include not more than three units from Group II. They must embrace two subjects of three units each from Group I. It is, however, strongly recommended that one or more studies be pursued throughout the four years of the high school course.

The subjects from which choice may be made, and the number of units which will be accepted in each subject, are as follows:

Group I

English Composition and Literature, 3 or 4 units.

Greek, 2 or 3 units.

Latin, 2, 3, or 4 units.

French, 2, 3, or 4 units.

German, 2, 3, or 4 units.

Spanish, 2, 3, or 4 units.

History, 1, 2, or 3 units.

Algebra, 1, $1\frac{1}{2}$, or 2 units.

Trigonometry, $\frac{1}{2}$ unit.

Geometry, 1 or $1\frac{1}{2}$ units.

Physics, 1 unit.

Chemistry, 1 unit.

Botany, $\frac{1}{2}$ or 1 unit.

Zoölogy, $\frac{1}{2}$ or 1 unit.

Physiology, $\frac{1}{2}$ unit.

Geology, $\frac{1}{2}$ unit.

Physiography, $\frac{1}{2}$ or 1 unit.

Three units of science may be offered as a three-unit subject.

In order that a half unit in science may be accepted it must be supplemented by a second half unit in science. For this purpose the following groupings are suggested: (a) Botany and Zoology; (b) Zoology (or Botany) and Physiology; (c) Physiography and Geology; (d) Physiography and Botany.

Two units of Mathematics and one unit of Physics may be offered as a three-unit subject, in which case a second unit of science must be presented.

Group II

Agriculture, 1 or 2 units.

Domestic Science, 1 or 2 units.

Drawing, $\frac{1}{2}$ or 1 unit.

Manual Training, 1 or 2 units.

Commercial Branches, 1 or 2 units.

Subjects from Group II will not be accepted for admission on examination.

(B) Graduates of schools on the approved list of the North Central Association of Colleges and Secondary Schools will be admitted upon the presentation of an unqualified recommendation covering not less than fifteen units, of which at least twelve must be from Group I. Admission on this basis of recommendation may be granted also to the graduates of other especially approved schools. Applications for this privilege must be made by the superintendent or principal on special blanks which may be obtained from the Dean.

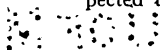
Applicants for admission who intend to enter the Combined Literary and Medical Course must offer two units of Latin. They are also strongly advised to present Trigonometry, Physics, and Chemistry. Those who enter without these subjects will ordinarily need to attend one Summer Session in addition to the regular term prescribed for the course.

SCOPE OF THE PREPARATORY WORK

The following descriptive outline indicates the amount of preparation expected in each of the subjects named:—

English Composition and Literature.—The three units in English composition and literature should cover the following subjects:—

Composition.—As preparation for this requirement, it is expected that the student will have prepared, under the direction of a



competent instructor, one or more written exercises each week for at least three years. A sufficient number of these exercises should be corrected by the teacher and revised by the student to secure the desired accuracy. It is highly desirable that longer and more carefully planned papers should be a feature of the fourth year. The subjects upon which the student writes should not be drawn exclusively from literature; a considerable proportion of them should be so distributed as to give proper training in the various types of discourse, namely, description, narrative, argument, and exposition.

The student's credentials should show the amount and character of the work in composition.

Rhetoric.—The student should be grounded in the essentials of rhetoric, but those principles should receive emphasis which are most likely to be of service to him in his practice in writing, such as the principles of sentential structure, paragraphing, and the outlining of the essay. The correction of stock specimens of bad English is not recommended, and will form no part of the entrance requirement.

Grammar.—The applicant should be prepared to state intelligently the essential principles of grammar and to explain the syntactical structure of any sentence encountered in his reading.

Readings of Classics.—The following books are recommended by the Joint Conference on Uniform Entrance Requirements in English:

For Reading.—Two books selected from each of the following groups:

Group I. (CLASSICS IN TRANSLATION.) The *Old Testament*, comprising at least the chief narrative episodes of Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther; the *Odyssey*, with the omission, if desired, of Books, I, II, III, IV, V, XV, XVI, XVII; The *Iliad*, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; The *Aeneid*. The *Odyssey*, *Iliad* and *Aeneid* should be read in English translations of recognized literary excellence. For any selection from this group a selection from any other group may be substituted. **Group II. (SHAKESPEARE):** *Midsummer-Night's Dream*, *Merchant of Venice*, *As You Like It*, *Twelfth Night*, *The Tempest*, *Romeo and Juliet*, *King John*, *Richard II*, *Richard III*, *Henry V*, *Coriolanus*, *Julius Caesar*, *Macbeth*, *Hamlet* (if not chosen for study.) **Group III. (PROSE FICTION):** Malory's *Morte d'Arthur* (about 100 pages); Bunyan's *Pilgrim's Progress*, Part I; Swift's *Gulliver's Travels* (voyages to Lilliput and to Brobdingnag); Defoe's *Robinson Crusoe*, Part I; Goldsmith's *Vicar of Wakefield*; Frances Burney's *Evalina*; Scott's Novels, any one; Jane Austen's Novels, any one; Maria Edgeworth's *Castle Rackrent*, or *The Absentee*; Dicken's Novels, any one; Thackeray's Novels, any one; George Eliot's Novels, any one; Mrs. Gaskell's *Cranford*; Kingsley's *Westward Ho!* or *Hereward, the Wake*; Reade's *The Cloister and*

the Hearth; Blackmore's *Lorna Doone*; Hughes's *Tom Brown's Schooldays*; Stevenson's *Treasure Island*, or *Kidnapped*, or *Master of Ballantrae*; Cooper's Novels, any one; Poe's *Selected Tales*; Hawthorne's *The House of the Seven Gables*, or *Twice Told Tales*, or *Mosses from an Old Manse*; A collection of *Short Stories* by various standard writers. **Group IV.** (ESSAYS, BIOGRAPHY, ETC.): Addison and Steele's *The Sir Roger de Coverley Papers*, or *Selections from the Tatler and Spectator* (about 200 pages); Boswell's *Selections from the Life of Johnson* (about 200 pages); Franklin's *Autobiography*; Irving's *Selections from the Sketch Book* (about 200 pages), or *Life of Goldsmith*; Southey's *Life of Nelson*; Lamb's *Selections from the Essays of Elia* (about 100 pages); Lockhart's *Selections from the Life of Scott* (about 200 pages); Thackeray's *Lectures on Swift, Addison and Steele in the English Humorists*; Macaulay, any one of the following essays: *Lord Clive*, *Warren Hastings*, *Milton*, *Addison*, *Goldsmith*, *Frederic the Great*, *Madame d'Arbly*; Trevelyan's *Selections from the Life of Macaulay* (about 200 pages); Ruskin's *Sesame and Lilies*, or *Selections* (about 150 pages); Dana's *Two Years before the Mast*; Lincoln's *Selections*, including at least the two Inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, the Letter to Horace Greeley; together with a brief memoir or estimate of Lincoln; Parkman's *The Oregon Trail*; Thoreau's *Walden*; Lowell's *Selected Essays* (about 150 pages); Holmes's *The Autocrat of the Breakfast Table*; Stevenson's *An Inland Voyage* and *Travels with a Donkey*; Huxley's *Autobiography* and selections from *Lay Sermons*, including the addresses on *Improving Natural Knowledge*, *A Liberal Education*, and *A Piece of Chalk*; A collection of *Essays* by Bacon, Lamb, DeQuincey, Hazlitt, Emerson and later writers; A collection of *Letters* by various standard writers. **Group V.** (POETRY): Palgrave's *Golden Treasury* (First Series): *Books II and III*, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's *Golden Treasury* (First Series). *Book IV*, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under B); Goldsmith's *The Traveler* and *The Deserted Village*; Pope's *The Rape of the Lock*; A collection of English and Scottish *Ballads*, as, for example, some *Robin Hood Ballads*, *The Battle of Otterburn*, *King Estmere*, *Young Beichan*, *Bewick* and *Grahame*, *Sir Patrick Spence*, and a selection from later ballads; Coleridge's *The Ancient Mariner*, *Christabel*, and *Kubla Khan*; Byron's *Childe Harold*, *Canto III* or *IV*, and *The Prisoner of Chillon*; Scott's *The Lady of the Lake*, or *Marmion*; Macaulay's *The Lays of Ancient Rome*, *The Battle of Naseby*, *The Armada*, *Ivry*; Tennyson's *The Princess*, or *Gareth and Lynette*, *Lancelot and Elaine*, and *Passing of Arthur*, Browning's *Cavalier Tunes*, *the Lost Leader*, *How They Brought the Good News from Ghent to Aix*, *Home Thoughts from Abroad*, *Home Thoughts from the Sea*, *Incident of the French Camp*, *Hervé Riel*, *Pheidippides*, *My Last Duchess*, *Up at a Villa—Down in the City*,

The Italian in England, The Patroil, The Pied Piper, "De Gustibus"—, Instans Tyrannus; Arnold's *Sohrab and Rustum*, and *The Forsaken Merman*; Selections from *American Poetry*, with special attention to Poe, Lowell, Longfellow and Whittier.

For Study and Practice: **Group I. (DRAMA):** Shakespeare's *Julius Caesar, Macbeth, Hamlet*. **Group II. (POETRY):** Milton's *L'Allegro, Il Penseroso*, and either *Comus* or *Lycidas*; Tennyson's *The Coming of Arthur, The Holy Grail, and The Passing of Arthur*; The selections from Wordsworth, Keats, and Shelley in *Book IV* of Palgrave's *Golden Treasury* (First Series). **Group III. (ORATORY):** Burke's *Speech on Conciliation with America*; Macaulay's *Speech on Copyright* and Lincoln's *Speech at Cooper Union*; Washington's *Farewell Address* and Webster's *First Bunker Hill Oration*. **Group IV. (ESSAYS):** Carlyle's *Essay on Burns*, with a selection from *Burns's Poems*; Macaulay's *Life of Johnson*; Emerson's *Essay on Manners*.

It is expected that the applicant will have read these books appreciatively and will have made himself familiar with the subject-matter and the form of each word. The reading should be connected, in reasonable measure, with the lives and the character of the authors read and with the history of their times.

Although the books mentioned above are recommended as preparation for this part of the requirement, they are not prescribed. Books of equal merit covering a similar range of literary types will be accepted as equivalents.

It is recommended that in connection with the reading of classics, the memorizing of notable passages, in both prose and poetry, should form a regular exercise throughout the whole preparatory period. This is all-important for the development of a correct taste in language and literature.

Applicants who present themselves for examination will be asked to write two essays of not less than two hundred words each, one upon a subject drawn from the books of the foregoing list, and the other upon a subject drawn from experience or observation. The language of these essays must be grammatical and clear. The spelling, punctuation, and capitalization must be correct. The applicant must show ability to discriminate in the use of words and to construct well organized sentences and paragraphs. A topical outline should accompany each essay. The applicant should also be prepared to answer questions upon the fundamental principles of grammar and rhetoric.

History of English Literature.—The applicant who offers four units in English composition and literature should have pursued the study throughout the four years of the high school course. In addition to the foregoing requirement his preparation should include a systematic study of the outlines of English literary history. Due emphasis should be laid upon the division of the subject into periods; and the leading characteristics of each period should be studied and,

so far as possible, illustrated by the reading of representative authors. Any of the current manuals of English literature may serve as the basis of this part of the work, which should occupy the third or fourth year of the course. The historical study should, however, be associated as closely as possible with the reading of classics.

Greek.—The two units in Greek should be made up of grammar, prose composition, and reading, as follows:

Grammar.—Goodwin's or Hadley's. The inflections must be thoroughly mastered.

Prose Composition.—Jones's *Exercises*, with special reference to the writing of Greek with the accents, and to the general principles of syntax. Woodruff's *Greek Prose Composition* is taken as an equivalent.

Reading.—Three books of Xenophon's *Anabasis* and two books of Homer.

The so-called continental sound of the vowels and diphthongs, and pronunciation according to the written accents are preferred.

Latin.—An applicant offering two units in Latin must have completed the beginners' Latin book, and must have read not less in amount than *Caesar, Gallic War, I-IV*, which may be selected from *Caesar, Gallic War and Civil War*, and *Nepos, Lives*; and he must, further, have devoted the equivalent of one recitation period a week for one year to the writing of exercises in Latin prose composition.

N. B.—This preparation is sufficient to enable the student to enter Latin A or B in the University.

An applicant offering three units in Latin must have completed the foregoing requirements for two units. He must, in addition, have read not less in the amount than Cicero, *the orations against Catiline, for the Manilian Law*, and *for Archias*, or Virgil, *Aeneid, I-VI*, which may be selected from Cicero, *orations, letters*, and *De Senectute*, and Sallust, *Catiline and Jugurthine War*, or Virgil, *Bucolics, Georgics*, and *Aeneid*, and Ovid, *Metamorphoses, Fasti*, and *Tristia*, and he must, further, be prepared to meet the requirements in Latin prose composition described below for four units.

The Latin reading required of applicants offering four units* of Latin, without regard to the prescription of particular authors and works, must not be less in amount than *Caesar, Gallic War, I-IV*, Cicero, *the orations against Catiline, for the Manilian Law*, and *for Archias*, Virgil, *Aeneid, I-VI*. This amount of reading must be selected with the following authors and works: *Caesar, Gallic War and Civil War*, and *Nepos, Lives*, Cicero, *orations, letters*, and *De Senectute*, and Sallust, *Catiline and Jugurthine War*, Virgil, *Bucolics, Georgics*, and *Aeneid*, and Ovid, *Metamorphoses, Fasti*, and *Tristia*. The applicant must, further, have devoted the equivalent of one recitation period a week for two years to the writing of exercises in Latin prose composition.

* According to the recommendation of the Commission of Fifteen on College Entrance Requirements in Latin.

The following is the scope of the examination of applicants who wish to offer four units in Latin as specified above, but who are not entitled to enter on diploma. Such applicants will be examined in translation at sight of both prose and verse. The vocabulary, construction, and range of ideas of the passages set will be suited to the preparation secured by the reading indicated above. Applicants will be examined also upon the following prescribed reading: Cicero, *orations for the Manilian Law* and *for Archias*, and Virgil, *Aeneid*, I, II, and either IV or VI, at the option of the applicant, with questions on the subject matter, literary and historical allusions, and prosody. Every paper in which passages from the prescribed reading are set for translation will contain also one or more passages for translation at sight; and applicants must deal satisfactorily with both these parts of the paper, or they will not be given credit for either part. The examinations in grammar and composition will demand thorough knowledge of all regular inflections, all common irregular forms, and the ordinary syntax and vocabulary of the prose authors read in school, with ability to use this knowledge in writing simple Latin prose. The words, constructions, and range or ideas called for in the examinations in composition will be such as are common in the reading of the year, or years, covered by the particular examination.

French.—The applicant who offers two units in French will be expected to pronounce French intelligently and with some fluency, to understand French when spoken in simple phrases and about familiar subjects, to read ordinary prose easily and accurately, and to write correctly in French simple sentences based on texts studied. This ability demands a firm grasp of the elements of grammar (such as the conjugation of the verb, both regular and irregular, the use of auxiliaries, the forms of the pronoun, the agreement of adjectives and particles, the main uses of the articles, and the order of words in the sentence), and such a familiarity with the structure of the sentence and common terms of expression and such command of vocabulary as may be given by the careful, well directed reading of three or four hundred pages of easy prose.

The applicant who offers three units in French should be able to read ordinary prose rapidly at sight, with clear understanding of the distinctions of tense and mode and all the common points of syntax, to reproduce in simple but connected French the substance of a narrative or dramatic text, and to follow ordinary explanations and commentaries made orally in French. In acquiring this ability accent should be laid on the rapid understanding of the French phrase, whether it be addressed to the eye or the ear. Much should be read, spoken, and dictated. At least six hundred pages of prose should be read, and in the end it should not be too easy.

The applicant who offers four units in French should be able to read at sight any French not offering very unusual difficulties of vocabulary or syntax, to translate into French a passage of simple

English, and to carry on a conversation in French upon a familiar subject. He should have had, in addition to what it required for three units, at least one thousand pages of French chosen from standard authors, and he should be able to answer questions on the content and meaning of the words read as well as upon the language in which they are written.

Spanish.—The applicant who offers two units in Spanish must be able to pronounce Spanish correctly, to take down easy dictation in Spanish, to translate intelligently easy Spanish prose, and to translate simple English sentences into Spanish sufficiently well to show a knowledge of the essentials of Spanish inflection and syntax. He should be able to understand and answer simple questions in Spanish.

The applicant who offers three units in Spanish should be able to read ordinary prose rapidly at sight, with clear understanding of the distinctions of tense and mode and all the common points of syntax, to give in simple connected Spanish the substance of a narrative, and to follow ordinary explanations and commentaries made orally in Spanish. He should have read at least five hundred pages of modern prose.

The applicant who offers four units in Spanish should be able to read at sight any Spanish not offering unusual difficulties of vocabulary or syntax, to translate into Spanish a passage of simple English, and to carry on a conversation in Spanish upon a familiar subject. He should have read at least as much as the applicant who offers three units, and should have a distinctly firmer practical grasp of the language.

German.*—The applicant who offers two units in German should be able to pronounce German correctly and should be thoroughly familiar with the everyday facts of the grammar. He should have read about 300-350 pages of standard modern prose and should be able to take part in a simple conversation in German on topics drawn from the works read. He should also be able to translate easy English prose into German.

The applicant who offers three units in German should, in addition to the work described above, be prepared as follows: He should have read two classics selected from the works of Lessing, Goethe, and Schiller, and about 250 pages of standard prose fiction and history. He should have a good knowledge of German syntax and should be able to write a short essay on some subject taken from the works read. He should also be able to translate ordinary English into German and to express himself in German grammatically and with ease on topics connected with his reading.

* A full statement of the requirements in German may be found in the "Report of the Committee of the German Section of the Michigan Schoolmasters' Club on a Uniform High School Course in German." Copies of the report may be obtained by applying to the professor of German.

The four units in German include the foregoing requirements and additional preparation as follows: The reading of five standard dramas (exclusive of those read in the third year) selected from the works of Goethe, Schiller, Lessing, Heinrich v. Kleist, and Grillparzer; a thorough command of German grammar, and the ability to speak and write German with considerable ease and correctness. The applicant should have written several longer essays on the works read.

History.—The applicant who offers one, two, or three units in history may select from the following list:

Ancient History to the year 800 A. D., one unit.

Mediæval and modern history, one unit.

English history, one unit.

United States history and government, one unit.

A year's work in general history, with the use of such a book as Meyers's *General History*, will still be accepted as one unit, though it is believed that better results will be obtained if a year is given to ancient history down to the fall of the Roman Empire (or, preferably, to the year 800 A. D.), and a year to mediæval and modern history.

The United States history is not the elementary work given in the lower grades, but an advanced course given in the later years of the high school.

Mathematics.—The three units in mathematics include algebra through quadratics, and geometry, both plane and solid (including spherical). Beman and Smith's *Elements of Algebra*, and the same authors' *New Plane and Solid Geometry* are mentioned to indicate the scope and character of the work required.

The applicant who presents two units in mathematics should have covered algebra through quadratics with one unknown and plane geometry. (See Beman and Smith's *New Plane Geometry*.)

Trigonometry.—The one-half unit in trigonometry should cover the work in plane trigonometry as given in Hall and Frink's *Trigonometry* or an equivalent in other authors.

Physics.—The unit in physics includes an amount represented by Carhart and Chute's *High School Physics*. The instruction in the class room should be supplemented by work in the physical laboratory to the extent of at least one period a week throughout the school year.

Chemistry.—The unit in chemistry covers the information which should be acquired in one year by the study of Brownlee's, Hessler and Smith's, Linebarger's, McPherson and Henderson's, Newell's, Remsen's, or other similar text. The study of the text should be accompanied by laboratory work done by the student. A thorough working knowledge of a few fundamental principles is more to be desired than a superficial knowledge covering a wider range.

Botany.—The unit required of those who offer botany for admission is expected to include as much as a competent teacher, trained in laboratory methods, can accomplish with his classes in a year. No attempt is here made to indicate the exact extent of the ground to be covered, for the teacher should have large liberty in selecting material and topics as occasion requires; but it is recommended that one-half year be given to the form, structure, and habits of flowering plants, while the other half-year may be given to the natural groups of plants, physiology, and the adaptation of form and structure to environment.

The following text-books are recommended as offering numerous and helpful suggestions: Atkinson's *Elementary Botany*; Bailey's *Botany*; Barnes's *Plant Life*; Bergen's *Foundations of Botany*; Coulter's *Plant Relations and Plant Structures*; Spalding's *Introduction to Botany*; Steven's *Introduction to Botany*. Ganong's *Teaching Botanist* is one of the most useful books for the teacher.

Zoology.—An applicant who offers a unit in zoology will be expected to have a knowledge of at least eight of the following animal types: 1 and 2. Two protozoa: Amœba, Parmamœcium, Vorticella, Stentor, Volvox; 3. A sponge: Spongilla or Grantia; 4. A hydroid: Hydra, to be compared with a medusoid form; 5. An echinoderm: starfish or sea-urchin; 6. An annelid: the earthworm or the leach; 7. A crustacean; crayfish, lobster, or crab; 8. An insect: butterfly (including immature stage), grasshopper, cricket, cockroach, or other insect; 9. A mollusk: the fresh water mussel or one of the snails; 10. A fish: minnow or perch; 11. An amphibian: frog, toad, tree-toad, salamander (Amblystoma), or mudpuppy (Necturus).

These forms must be studied by the laboratory method. Laboratory work should be directed not merely toward a study of animal structure, but as far as practicable toward the study of habits and reactions. It should furnish the basis for the class room discussion of principles; especially of evolution. Of the four periods per week that must be given to the work, two at least should be given to recitations or other class exercises. Careful original notes and drawings must be presented by applicants as part of the examination.

The mention of the following books may serve to indicate the character of the work required: Needham's *Elementary Lessons in Zoology*; Davenport's *Introduction to Zoology*; Jordan and Kellogg's *Animal Life*; French's *Animal Activities*.

Physiography.—The applicant who offers one-half unit in physiography must have studied in class one of the following books for a half year: Dryer's *Lessons in Physical Geography*; Gilbert and Brigham's *Introduction to Physical Geography*; Davis's *Elementary Physical Geography*; Tarr's *New Physical Geography*, or an equivalent. In this connection field excursions are earnestly recommended.

Meteorology will not be included in the examination.

The applicant who offers one unit in Physiography should have studied the subject in high school for at least one year under a competent instructor, and with the aid of field excursions and laboratory practice.

The ability to read a topographic map is essential in physiographic study; teachers will find the topographic maps issued by the United States Geological Survey an important aid.

Physiology.—One-half unit. The anatomy and physiology of the human body, and the essentials of hygiene. Recitations and laboratory work, with the aid of charts and models, as treated in the standard texts. The course should be preceded by at least a half year of Zoology of a course in General Biology.

Agriculture.—One or two units. Recitations and laboratory work in the various divisions of agriculture, including farm crops and horticulture, animal and dairy husbandry, soil physics, soil fertility, and farm mechanics. The study should be preceded by a course in Botany.

Domestic Science.—One or two units. Recitations and laboratory work in the selection, preparation, and chemistry of foods; the properties and selection of fabrics, and the designing and making of clothing; and the systematic supervision and performance of the various operations of housekeeping.

Drawing.—One-half or one unit of work along one or more of the following lines, a unit meaning the equivalent of at least 360 periods, not less than forty-five minutes each:

In Freehand Drawing, the correct representation of geometrical and simple natural or decorative forms;

In Mechanical Drawing, exercises in the use of instruments, the accurate geometrical construction, orthographic projections and working drawings;

In Design, the principles of design with simple applications.

Manual Training.—Students may present one or two units, a unit meaning the equivalent of at least 360 periods, not less than forty-five minutes each. The work accepted may be:

1. Bench work, wood turning, cabinet making, and pattern making in the wood shop.

2. Forging, chipping, and filing, sheet-metal construction, tool making, turning and spinning in metals.

Commercial Branches.—Not more than a total of two units will be accepted in these subjects, to be selected from the following list.

Advanced Arithmetic.—One half unit. Credit will be allowed for arithmetic only if taken after at least one unit of algebra.

Double Entry Bookkeeping.—One-half or one unit. If credit to the extent of a full unit is sought, the student should devote at least ten periods of not less than forty-five minutes each in class each week for one academic year. The applicant should have a working knowledge of single and double entry bookkeeping in the

usual lines of business. He should understand the use of the various books such as the journal, cash book, sales book, invoice book, ledger, and special column journals and cash books. He should know how to prepare profit and loss statements and balance sheets, and to explain the meaning of the items involved in both kinds of statements.

Commercial Geography.—One-half unit. The amount and character of work accepted in this subject is indicated by the scope of the best text-books in the subject.

Industrial History.—One-half or one unit. The scope of this work is indicated by such texts as Cheyney or Cunningham in English industrial history, or Wright, Coman, or Bogart in American history.

Elementary Economics.—One-half unit. The applicant should have a knowledge of the leading facts and principles in Economics, including such subjects as division of labor, the factors of production, the law of diminishing returns, demand and supply, value and prices, and international trade. One of the better elementary texts in use will serve as a basis. This should be supplemented with discussions and problems.

ADMISSION ON EXAMINATION.

Applicants for admission who are not entitled to enter on diploma (see page 112) must take the entrance examination. They should register with the Dean, or the Registrar, at his office in University Hall, the day before examination begins. The office will be open for this purpose Monday, September 21, 1914, and Wednesday, February 3, 1915, from 9 to 11, and from 2 to 5.

The applicant may divide the examination into two parts, taking one part either a year or a semester before the date of his admission and the second part at the time of admission. But if he fail to secure the requisite number of units within the specified time he forfeits all credits for the subjects he may have passed.

The examination in the several subjects will be in writing and will be held in Tappan Hall in accordance with the schedules given below. Applicants presenting themselves too late for the scheduled examinations are required to pay an examination fee of five dollars.

This Department conducts the examinations for admission to all Departments of the University. Examinations in those subjects accepted by other Departments, but not by this, will be provided for on application to the Registrar.

*SCHEDULE OF EXAMINATIONS FOR ADMISSION,
SEPTEMBER, 1914.*

	Tuesday Sept. 22	Wednesday Sept. 23	Thursday Sept. 24	Friday Sept. 25	Saturday Sept. 26
8-11	English Composition	History	Geometry	Algebra	Physics
1-3:30	Botany	English Literature	Latin English Composition	German Greek	French Spanish
3:30-6	Chemistry	Zoology Physiology	Physiography Geology	Latin	Trigonometry

*SCHEDULE OF EXAMINATIONS FOR ADMISSION,
FEBRUARY, 1915.*

	Thursday, Feb. 4	Friday, Feb. 5	Saturday, Feb. 6
8-10	English Composition	Algebra Trigonometry	Geometry
10-12	Botany Zoology	Physiography Geology	Chemistry
2-4	History	Physics	Latin Greek
4-6	Physiology	French German Spanish	English Literature

All examinations are held in Room 203, Tappan Hall, excepting those in French, German, and Spanish, which are in Room 202, Tappan Hall.

ACCREDITED SCHOOLS.

The privilege of sending pupils for admission on diploma is limited to schools that have been approved by the Faculty. On request of the proper authorities, the Faculty sends an officer of the University to visit a school and report upon its condition. If satisfied from the report of this officer that the school is taught by competent instructors, and is furnishing a good preparation to meet the requirements for admission, describing on pages 98 to 110, then the Faculty places the school on the approved list for a period not exceeding three years (inclusive of the year of visitation); reserving, however, the right to require another inspection, if within the period specified in each case, important changes affecting the course of study in the school, or the efficiency of the instruction, seem to make an examination necessary.

The superintendent of each approved school is expected to send to the President of the University, annually, at a date not later in the year than March first, a catalogue of the school, or, if no catalogue is published, he is expected to send a statement giving the names of the teachers, the number of pupils, and a description of the courses of study.

ADMISSION ON CERTIFICATE

Only those applicants will be admitted without examination who are graduates of schools accredited to this University, and who present a recommendation, signed by the principal of the school, certifying that they have satisfactorily completed all the work required for admission. The recommendation must be made on a blank form furnished by the University.

It is expected that the principal will recommend not every graduate, but only those whose ability, application, and scholarship are of such superior grade that the school

is willing to stand sponsor for their success at the University.

The principals of approved schools are urged to send directly to the Dean, upon the close of the school year, the recommendation of each graduate intending to enter this Department of the University at the beginning of the ensuing college year. If, on inspection, the recommendation is found satisfactory, the Dean will forward to the applicant a certificate entitling him to admission without examination. The address of the applicant is to be entered on this blank.

CONDITIONAL ADMISSION

No applicant will be admitted who presents less than fifteen units.

An applicant for admission either on examination or diploma, who presents fifteen units from the lists on pages 99 and 100, but who is deficient in not more than two units, there specified as mandatory, may be admitted conditionally; but any condition thus incurred must be removed during the first year of residence. No student who has an admission condition outstanding at the beginning of his second year of residence will be allowed to enter his classes until such condition is removed.

ADMISSION TO ADVANCED STANDING

I. A student who brings a certificate of standing from an approved college or university, showing that he has satisfactorily completed at least one year of the curriculum of the institution from which he comes, may be admitted without examination to equal standing in this Department of the University. A graduate of one of the stronger courses of an approved normal school, who brings an official certificate explicitly describing the extent

and character of his work, may be given, without examination, such advanced standing as is justified by the course he has completed.

The certificates above referred to must be presented to the Dean of the Department as early as the fifteenth of October (or, if the student enter at the beginning of the second semester, as early as the first of March).

2. All other applicants for advanced standing must present to the Registrar on October 16 (or, if they enter at the beginning of the second semester, on February 28) a statement showing the amount of work done in the subjects in which credit is asked. The Registrar will thereupon furnish a blank form for presentation to the professors in charge of the several subjects designated in the blank, who will determine the amount of credit to which the applicant is entitled in accordance with one of the following conditions:

Either the applicant must pass a satisfactory examination in the work presented; or the applicant must, during his first year of residence in the University, creditably complete in the department of study concerned a course presupposing a satisfactory knowledge of the work for which credit is asked.

No advanced credit is granted for subjects studied in the high school, unless the student has taken a post graduate high school course of at least one semester.

All advanced credit shall be subject to revision at the end of the first year of residence.

Credits must be secured and returned to the Registrar as early as the first of November (or, if the student enter at the beginning of the second semester, as early as the fifteenth of March). An account once closed cannot be reopened without special permission of the Dean.

ADMISSION OF STUDENTS NOT CANDIDATES FOR A DEGREE

Persons who wish to pursue studies in the Department without becoming candidates for a degree may be admitted under the following conditions.

A. Persons over twenty-one and under twenty-five years of age, not provided for in Section B, may be admitted if they present satisfactory credentials, showing their preparation for academic work, and pass entrance examination in nine units chosen from those accepted for entrance (see page 99). Certificates will not be accepted in place of these examinations. The nine units must include three units in English and one unit in Algebra. Before the beginning of their third year of residence, such students must make up the remaining units required for admission to regular standing.

B. Persons over twenty-one years of age who have taught two years in schools of grammar or high school grade, and all persons over twenty-five years of age may be admitted, provided they pass an examination in English, and show that they are qualified to pursue profitably the studies they may desire to take up. In this examination in English, applicants will be asked to write brief essays on subjects that will be assigned, and to answer questions on the rudiments of English Grammar. The examination will be held in Room 203, Tappan Hall, at 8 A. M., Tuesday, September 22, or at 1 P. M., Thursday, September 24.

The Dean's office will be open for the registration of applicants for admission on and after Monday, September 21, from 9 to 11, and 2 to 5.

Should a student thus admitted subsequently become a candidate for graduation, he must pass all the examinations for admission required of such candidate, at least one year before the time when he proposes to graduate.

Such students who wish credit for studies pursued before admission are referred to the rules relating to advanced standing given above.

REQUIREMENTS FOR GRADUATION

The degree of Bachelor of Arts is conferred upon students who have earned one hundred twenty hours of credit (together with one hundred thirty-five points*) in accordance with the following requirements:

1. The credit must include Courses 1 and 2 in Rhetoric, which must be taken in the first year of residence.

2. In addition to the required courses in Rhetoric, the credit must include at least twelve hours from each of the following three groups, to be taken by the end of the third year of residence. (In the case of students who enter with advanced credit, or in other exceptional cases, the requirement that the group electives must be taken before the end of the third year may be waived upon application to the Advisory Committee.)

Group I: Ancient Languages and Literatures, Modern Languages and Literatures, Rhetoric, (other than Courses 1 and 2).

Group II. Mathematics, Astronomy, Physics, Chemistry, Mineralogy, Geology, General Biology, Zoology, Botany, Psychology.

Group III. History, Political Economy and Sociology, Political Science.

3. To complete the one hundred twenty hours required for graduation, the student may select from the work offered in the announcement of the Department of Literature, Science, and the Arts, such courses as he is qualified to pursue, subject only to the rules which follow:

* For students graduating prior to June, 1916, the requirement is 120 hours of credit and 120 points.

a. Not more than eighty hours of elective studies may be taken in any one of the three groups specified above.

b. Not more than forty hours may be elected in any one department of study (as, for example, Greek, Philosophy, Mathematics, History, etc.)

c. At least two-thirds of the work taken in residence beyond the Sophomore year, must be in courses not open to first year students.

d. No candidate will be recommended for the bachelor's degree who has been in residence at this University less than one academic year and who has earned while in residence here less than thirty hours of credit.

4. Special mention in a subject, to be named on the diploma, may be secured by consistently good work in the series of courses outlined in that subject for that purpose.

A student who has earned at least sixty of these one hundred and twenty hours in mathematics and the physical and biological sciences may, at his option, receive the degree of Bachelor of Science, instead of Bachelor of Arts.

The degree of Bachelor of Science in Forestry is conferred upon students who have earned one hundred twenty hours of credit (together with one hundred thirty-five points) including the prescribed program of studies given on page 128).

For a matriculated student regularly enrolled in this Department a Summer Session will be considered as equivalent to one-half a semester's residence.

Only those who are present in person may receive their diplomas on Commencement Day. Others who have satisfied all the requirements for graduation, including the payment of the graduation fee, will receive their degrees at a subsequent meeting of the Board of Regents.

The graduation fee of ten dollars must be paid to the Treasurer of the University at least twenty-five days prior

to the date of graduation. The same rule applies to the fee for the Teacher's Diploma; candidates for the Teacher's Diploma must have been enrolled with the Head of the Department of Education for a like period.

REGISTRATION

A. All undergraduate students in the Department of Literature, Science, and the Arts are required, at the beginning of each year of residence, to enroll with the Registrar, to pay their fees to the Treasurer, and to file with the officer hereafter to be designated an election blank properly filled out, showing the courses they expect to pursue during the semester. These three things shall be considered as constituting Registration in this Department.

All students entering this Department for the first time must present their credentials to the Dean and secure from him an admission card before enrolling with the Registrar.

B. Students may register at any time up to and including the second day of the semester. After the second day, students may register only with permission of the Dean, and upon payment of an additional fee of \$5.00. This fee may, in special cases, of enforced absence or illness, be remitted upon application to the Dean.

C. The election blanks of all first year students and of all students not candidates for a degree must be presented in person to the Committee on Elections. The election blanks of all other students must be presented in person to the Registrar. No credit is given for courses not properly elected. No student is allowed to elect merely a part of a course.

1. *First-Year Elections.*—Rhetoric 1 and 2 must be taken the first year of residence, unless for exceptional reasons a postponement is allowed by the Committee on

Elections: In addition to the work in Rhetoric, students entering with less than thirty hours of advanced credit are expected to elect each semester, three of the following courses, making a total of fifteen hours a week:

Greek, 1, 2 (or A, B).	Mathematics, 1, 2 (or 1E, 2E).
Latin, 1 or 1a, 2 (or A, B).	Physics, 1, 2.
French, 1, 2 (or 3, 4).	Chemistry, 1 and 1a, 2 and 2a.
German, 1, 2 (or 3, 4).	{ Zoology, 1, 2.
History, 1, 2 (or 1a, 2a).	{ Botany, 1, 2.

If a student has credit either toward admission or toward graduation, for Courses 1 and 2, in either French or German, he may elect Courses 3 and 4. If his credit includes second-year French or second-year German, he may elect the work of the third year.

Course 1 in Physics must be preceded or accompanied by a course in Plane Trigonometry.

Courses, the equivalents of which have been offered for entrance, can not be again elected with credit.

In no case may courses not on this list be elected by first-year students without the permission of the Committee on Elections. The committee may be consulted between 4 and 6 daily, from Tuesday, September 22, to Wednesday, September 30, in Room 101, University Hall, and at other hours to be announced.

2. *Number of Hours Allowed.*—In accordance with the provisions of the foregoing rule, first-year students are required to elect fifteen hours a week. For all except first-year students the maximum number of hours a week that may be elected without special permission is sixteen, the minimum twelve.

On special request students of exceptional proficiency may be granted additional hours, but in all cases such requests must be made in writing on a blank form provided by the Registrar, and must be filed with the regular election blank, on which the elections should be made as if the request has been granted.

All requests for permission to take less than the minimum number of hours must be made in writing, stating the proposed election and the reasons therefor, and must be filed with the regular election blank, on which the election should be made as if the request had been granted.

When students are allowed to make up preparatory studies in the Ann Arbor High School a corresponding reduction is made from the maximum number of hours allowed them in the University.

D. Every student is required to file with the same officers, on or before the Saturday next preceding the final examination in February of each year, an election blank showing the studies he expects to pursue during the second semester. Election blanks presented after this date will be accepted only upon payment of \$1.00. This fee may, in exceptional cases, be remitted upon application to the Dean.

E. Necessary changes in elections may be made during the first week of the semester, by filing with the Registrar a revised election blank not later than 5 P. M. on Thursday or Friday of that week. In the case of first-year students and of all special students such changes can be made only after consultation with the Committee on Elections.

F. After the first week changes may be made only by permission of the Administrative Board and upon the payment of a fee of \$1.00. This fee may be remitted only by the Administrative Board. Such requests for permission to take up or drop studies must be made in writing on specially provided blank forms and in accordance with the rules printed thereon. Membership in the class does not cease until permission to drop the course has been granted by the Administrative Board (as represented by the Dean or the Registrar) and notice sent to the instructor. Authority to grant permission to drop, take up, or change courses has not been delegated to the instructors.

MEETING FOR FIRST YEAR WOMEN

All freshmen women are required to report at Barbour Gymnasium Tuesday, September 29, at 4 P. M., to receive general instructions from the Dean of Women and the Physical Director.

RULES RELATING TO EXAMINATIONS AND MARKS

1. A final examination is given in every course in accordance with the schedule issued each semester. No examination may be held except as announced in this schedule, and no date of examination may be changed without special vote of the Faculty.

2. Students are required to take the examination in all courses except such as they may have dropped with the consent of the Administrative Board.

3. Students are in no case examined at any other time than that set for the examination of the class in which the work has been done. In case of unavoidable conflicts a special examination during examination week may be arranged by the instructor with the consent of the Administrative Board.

4. The final semester reports are made in accordance with the following system of marking: A, excellent; B, good; C, fair; D, partially passed, without points; E, not passed; I, incomplete; X, absent from examination. These reports are not given out to the students by the instructors, but are regularly issued from the office of the Registrar.

Each hour of credit is valued in points as follows: A, three points; B, two points; C, one point; D, no points; E, no hours credit and no points. All advanced credit is regarded as of grade C.

This system of grades and points took effect in June, 1912. Each hour credit earned prior to that date is reckoned as of grade C.

5. A student may be reported Incomplete, if some small portion of his work remains unfinished, provided his standing in the course has been of grade C or higher. To secure credit, this work must be completed within one month after the beginning of the following semester; otherwise the course will be recorded as of grade E.

6. A student reported Absent from Examination may, on presenting a satisfactory excuse, receive permission from the Administrative Board to take the examination within one month after the beginning of the following semester. In case such a supplementary examination be not taken and passed, the course will be recorded as of grade E.

7. If a student is reported E in any course, he can receive no credit for that course unless it has been again elected and pursued as though it had not been elected before.

8. Any student who desires to remove an incomplete, or who desires to take an examination from which he was reported absent at the regular time, must first obtain from the Registrar a blank form for presentation to the instructor in charge of the examination. This blank, when signed, must be filed with the Registrar within one week from the time of the examination. A fee of \$1.00 is charged for blanks obtained after the specified time.

9. Students of other Departments who absent themselves from courses elected in this Department forfeit the privilege of electing courses in this Department.

RULES RELATING TO LABORATORY COURSES

No credit is given for laboratory courses until all laboratory charges are paid, and in all cases where such charges are not paid within two weeks after the close of the semester in which the work was taken, a fine of \$1.00 is imposed before credit is given. All regular laboratory fees are payable in advance. See page 93.

This report of grade withheld is treated as an incomplete. In order to secure credit for the course, the student must, within one month after the beginning of the following semester, procure from the Registrar a blank, to be returned to him as soon as signed by the instructor. After two weeks from the close of the semester, this blank will be issued only upon presentation of the receipt of the Treasurer of the University for the \$1.00 fine.

RULE RELATING TO DEFICIENCIES IN ENGLISH

Any instructor who finds the written work of a student seriously defective in its English is expected to report the case, together with specimen papers, to a committee consisting of the Dean and the Professor of Rhetoric, who shall have power to require additional work in composition without credit.

RULES RELATING TO DELINQUENTS

1. *Warning*.—A student whose work is unsatisfactory is warned. In all such cases notice of the character of the work is sent to the student and to his parent or guardian.

2. *Probation*.—A student whose work is extremely unsatisfactory is put on probation. This means that he is in imminent danger of dismissal from the University. This penalty of dismissal may be incurred through unsatisfactory work in a single course. During the period of probation the student is on trial to prove his fitness to do work in the University. He is required to devote all his time to his studies.

RULES GOVERNING PARTICIPATION IN PUBLIC ACTIVITIES

For the rules governing participation in public activities see page 83.

RULES RELATING TO ABSENCE

1. All absences should be explained to the Committee on Attendance within one week. Every absence not explained within two weeks will be marked unexcused. If summonses are not responded to within one week all absences involved will be marked unexcused. Absences pending adjustment for more than one week will be marked unexcused.

2. Excessive absence shall render the student liable to a reduction in general credit for the semester.

3. Willful disregard of summons from the Attendance Committee or the Dean shall render the offender liable to suspension.

PHYSICAL TRAINING FOR MEN

Work in Waterman gymnasium, twice a week, is required of first year students. The work begins on the first Monday in November, but students are expected to report to the Director of the gymnasium between October 1 and October 25 for physical examination and assignment to sections. No credit toward graduation is given for this work.

PHYSICAL TRAINING FOR WOMEN

Either Course 1, 2, or 3 is required of all women students belonging to any of the following categories: All freshmen; all students entering the University with more than one year's advanced standing, who do not bring an official statement of credit for previous college work in physical training; all special students, except those of mature age who, in the judgment of the Dean of Women, are entitled to be excused; all students above the rank of freshman, who have previously been excused on account of poor health. Students will be excused from this requirement only on account of ill-health.

No college credit is given for Physical Training.

1. Swedish System of Gymnastics. Floor work for improving posture, breathing, and coördination of muscles, apparatus work, marching, and gymnastic games. For freshmen who have had no gymnastic work. Three periods a week from November 1 to the spring recess.

2. Advanced Freshman Class. For students who have had one year of systematic high school work in physical training. Three periods a week from November 1 to the spring recess. Two periods of Swedish gymnastics more advanced than in Course 1; one period of aesthetic dancing.

The dancing period is open to other students above the rank of freshman, who have not had dancing.

3. Special Work. For students physically unable to take Course 1 or 2, and for those needing corrective work. Three periods a week from November 1 to the spring recess.

4. Advanced Class in Games and Gymnastics. One period of gymnastics a week, open to students above the rank of freshman. One period a week of team games suitable for playground and gymnasium open to all students.

5. Advanced Class in Aesthetic Dancing. Open to students above freshman rank who have done satisfactory work in the beginners' course.

6. Preliminary Training for Basket Ball. Gymnastic class for upper class women who play basket ball. One period a week. Basket ball practice one period a week.

7. Tennis, Hockey, Archery. Freshmen are required to take three periods a week of outdoor work from the spring recess to June 1. This work is also open to other students.

8. Swimming, individual instruction. Open to all women students in the University.

9. Normal Classes in Folk Dancing and Games for School-room and Playground. Once a week during the second semester. Practice in teaching the class and children in public school grounds.

No student can take part in any of the work described in the foregoing courses until she has purchased a locker ticket. These are to be obtained from the University Treasurer.

The gymnastic work announced for freshmen is a regular academic requirement, and as such is subject to the usual regulations regarding absence and quality of work.

All students entering the University are carefully examined and measured. Other students taking any of this work are required to undergo heart and lung tests.

A regulation gymnasium suit of black serge is required. Orders for suits may be given at the office of the Director. Attempts to make the suits at home are very inadvisable unless detailed instructions are secured from the Director.

COMBINED LITERARY AND MEDICAL COURSE*

Students desiring to obtain the degrees of Bachelor of Arts in the Department of Literature, Science, and the Arts, and of Doctor of Medicine in the Department of Medicine and Surgery, may, by enrolling on the combined Literary and Medical course, shorten from eight years to seven the time required to earn the two degrees. This privilege is open only to students who throughout their course maintain a uniform record of good scholarship. The work is done under the direction of a Committee of five members representing the Department of Literature, Science, and the Arts, and the Department of Medicine and Surgery. With the consent of the Committee in charge, a candidate for the degree of Bachelor of Arts, who has been a student in the Department of Literature, Science, and the Arts for at least one year, and has 90 or more hours to his credit, of which at least 30 hours have been earned in the Department of Literature, Science, and the Arts of this University, may enroll upon the combined course; that is, while continuing his registration in this Department he may also register in the Department of Medicine and Surgery, provided the work he has already completed includes a sufficient number of the courses enumerated below to enable him to complete within one year the specific requirement described in the following paragraphs.

* The rules here laid down govern also the Combined Course leading to the degrees of Bachelor of Arts, or Bachelor of Science, in the Department of Literature, Science, and the Arts, and of Doctor of Medicine, in the Homoeopathic Medical College. All students entering upon the Combined Course must satisfy fully the requirements for admission to the Department of Literature, Science, and the Arts. They must present two units of Latin and should also present Trigonometry, Physics, and Chemistry. Otherwise an attendance upon one Summer Session will ordinarily be necessary in addition to the residence herein prescribed.

All students who desire to enter upon the Combined Literary and Medical Course must, before May 15 of the year preceding double registration, file with the Registrar, upon a blank to be obtained from him a petition to be granted that privilege.

When the student so registered in the two Departments has completed the first year of the Course of Medicine, and not less than 90 hours in the Department of Literature, Science, and the Arts, he will be recommended for the degree of Bachelor of Arts, provided he has completed the requirements for graduation from the latter Department (see page 116), and provided his work has included the following courses:

Rhetoric, 6 hours including Courses 1 and 2.

French and German, 16 hours of either one, and 8 hours of the other.

English, 6 hours.

Psychology, 6 hours.

Physics, 10 hours, including two hours of laboratory work.

Chemistry, general, qualitative, and organic, 12 hours for students presenting Chemistry for entrance, otherwise 16 hours.

Physical Chemistry, 4 hours.

Zoology, 10 hours.

Botany, 4 hours.

Total, 82 or 86 hours.

Suggested electives: Latin or Elementary Greek, 8 hours; History, or Political Economy, or Philosophy, 8 hours; Qualitative Analysis, 4 hours; Organic Chemistry, 5 hours.

Students who so desire, may obtain the degrees of Bachelor of Science in Medicine and Doctor of Medicine in six calendar years by complying with the requirements above set forth except that they must complete the first and second years of the Course of Medicine, and that the credit required from the Department of Literature, Science, and the Arts instead of 90 hours, shall be 67 hours before they may enter upon the combined course and 75 hours before they receive the B.S. (in Med.) degree, and shall include the following courses:

Rhetoric, 6 hours, including Courses 1 and 2.

French or German, 16 hours.

Physics, 8 hours.

Chemistry, general, qualitative, and organic, 12 hours for students presenting Chemistry for entrance, otherwise 16 hours.

Zoology, 4 hours.

Botany, 4 hours.

Total, 50 or 54 hours.

The completion of this course will ordinarily require two and one-half years, or two years and two summer sessions, in the Department of Literature, Science, and the Arts. Students whose scholarship is sufficiently high may apply for permission to elect a limited number of extra hours.

Students who entered the Department of Literature, Science, and the Arts in the fall of 1913, or before, and who enroll upon the Combined Course in the fall of 1915, or before, are required to complete 60 hours in that Department.

Electives are suggested from the courses before mentioned.

COMBINED LITERARY AND LAW COURSE

Students desiring to obtain the degrees of Bachelor of Arts in the Department of Literature, Science, and the Arts, and of Bachelor of Laws, in the Department of Law, may, by enrolling on the Combined Literary and Law Course, shorten from seven years to six the time required to earn the two degrees. This privilege is open only to students, who throughout their course, maintain a uniform record of good scholarship. The work is under the direction of a joint committee of five members, representing the Department of Literature, Science, and the Arts, and the Department of Law. With the consent of the committee in charge a candidate for the degree of Bachelor of Arts, who has been a student in the Department of Literature, Science, and the Arts for at least one year, and has 92 or more hours to his credit, of which at least 30 hours have been earned in the Department of Literature, Science, and the Arts of this University, may enroll on the combined course; that is, while continuing his registration in this department he may also register in the Department of Law, provided the work he has already completed includes a sufficient number of the courses enumerated below to enable him to complete within one year the specific requirement described in the following paragraphs.

All students who desire to enter upon the Combined Literary and Law Course must, before May 15 of the year preceding double registration, file with the Registrar, on a blank to be obtained from him, a petition to be granted that privilege.

When the student so registered in the two Departments has completed the first year of the Law Course and not less than ninety-two hours in the Department of Literature, Science, and the Arts, he will be recommended for the degree of Bachelor of Arts, provided he has completed the requirements for graduation from the latter Department (see page 116), and provided his work has included the following courses:

Rhetoric, 12 hours, including Courses 1, 2, 3, and 4.
 Mathematics, or a science including laboratory work, 8 hours.
 Latin, or French, or German, or Spanish, 8 hours.
 English History, 1a and 2a, or 3 and 4.
 English Literature, 6 hours.
 Total, 42 hours.

Latin is strongly urged as desirable for every student preparing to study Law.

In addition to the required courses the student is advised to elect at least forty hours from the following subjects:

Latin or elementary Greek, 8 hours, Courses 3 and 4; French, German or Spanish, 16 hours; History, 14 hours, including Courses 14 and 15; Political Science, 12 hours; Economics, 16 hours, including Courses 1, 6, 9, 9a, 15 and 38; Philosophy, 7 hours, including Logic or Psychology, and Political Philosophy or Ethics; Mathematics, 2 hours, Course 51; Oratory, 4 hours.

TWO YEAR COURSE

PRELIMINARY TO THE STUDY OF LAW.

The following course in the Department of Literature, Science, and the Arts is suggested by the Faculty of the Department of Law for students looking to the study of law, who are unable to devote more than two years to collegiate preparation.

FIRST YEAR

Rhetoric, Courses 1, 2.

Latin, Courses 1, 2.

History, Courses 1a, 2a.

Mathematics, Courses 1, 2.

SECOND YEAR

Rhetoric, Courses 3, 4.

Latin, Courses 3, 4.

English Literature, 6 hours.

History, Courses 14, 15.

Economics, Courses 1, 2.

Philosophy, Course 9 (Logic).

All students in the Department of Literature, Science, and the Arts, who contemplate taking the law course, are urged to select as nearly as possible the courses outlined above. The substitution of a modern language for Latin may be made in the case of students whose preliminary work has not included the necessary preparation, though students of law are strongly urged to include Latin in their course.

COMBINED LITERARY AND DENTAL COURSE

Students desiring to obtain the degrees of Bachelor of Arts in the Department of Literature, Science, and the Arts, and of Doctor of Dental Surgery in the College of Dental Surgery, may, by enrolling on the combined Literary and Dental course, shorten from seven years to six the time required to earn the two degrees. This privilege is open only to students who throughout their course, maintain a uniform record of good scholarship. The work is under the direction of a Committee of five members representing the Department of Literature, Science, and the Arts, and the College of Dental Surgery. With the consent of the Committee in charge, a candidate for the degree of Bachelor of Arts, who has been a student in the Department of Literature, Science, and the Arts for at least one year, and has 90 or more hours to his credit, of which at least 30 hours have been earned in the Department of Literature, Science,

and the Arts of this University, may enroll upon the combined course; that is, while continuing his registration in this Department he may also register in the College of Dental Surgery, provided the work he has already completed includes a sufficient number of the courses enumerated below to enable him to complete within one year the specific requirements described in the following paragraph.

Students who desire to enter upon the Combined Literary and Dental Course must, before May 15 of the year preceding double registration, file with the Registrar, on a blank to be obtained from him, a petition to be granted the privilege.

When the student so registered in the two Departments has completed the first year of the Dental Course, and not less than 90 hours in the Department of Literature, Science, and the Arts, he will be recommended for the degree of Bachelor of Arts, provided he has completed the requirements for graduation from the latter Department (see page 116), and provided his work has included the following courses:

Rhetoric, 6 hours, including Courses 1 and 2.

French and German, 16 hours of either one, and 8 hours of the other.

Physics, 12 hours including 4 hours of laboratory work.

Chemistry, general, qualitative, and organic, 14 hours for students presenting Chemistry for entrance, otherwise 18 hours.

Zoology, 12 hours.

Botany, 4 hours.

English, 6 hours.

History, 8 hours.

Total, 84 or 88 hours.

Suggested electives: Latin or Greek, 8 hours; Philosophy, 3 hours; Physical Chemistry, 3 hours.

COURSE IN FORESTRY

The course in forestry is organized as a special program of study in the Department of Literature, Science, and the Arts, and leads to special degrees (Bachelor of Science in Forestry and Master of Science in Forestry). The requirements for the degree of Bachelor of Science in Forestry are stated on page 117. The prescribed program of studies there-referred to is as follows:

PROGRAM OF STUDIES

FIRST YEAR

FIRST SEMESTER

Rhetoric 1, 3 hours.

Zoology 1, 2 hours.

Botany 1, 2 hours.

Mathematics 1, 4 hours.

Chemistry 1 and 1a, 4 hours.

SECOND SEMESTER

Rhetoric 2, 3 hours.

Zoology 2, 2 hours.

Botany 2, 2 hours.

Mathematics 2, 4 hours.

Chemistry 2 and 2a, 4 hours.

Forestry 22, 1 hour.

SECOND YEAR	
FIRST SEMESTER	SECOND SEMESTER
Forestry 1, 4 hours.	Forestry 2, 2 hours.
Surveying 12, 4 hours.	Surveying 13, 4 hours.
Botany 13, 4 hours.	Botany 14, 4 hours.
Physics 1, 4 hours.	Physics 2, 4 hours.
	Mineralogy 1, 2 hours.
THIRD YEAR	
Forestry 3, 3 hours.	Forestry 4, 2 hours.
Forestry 5, 3 hours.	Forestry 6, 3 hours.
Forestry 7, 3 hours.	Forestry 8, 3 hours.
Geology 1, 3 hours.	Mineralogy 9, 2 hours.
	Botany 26, 4 hours.
Summer term: Surveying 3, eight hours at Camp Bogardus. (Elective)	
FOURTH YEAR	
Forestry 11, 2, 3 or 4 hours.	Forestry 12, 2, 3, or 4 hours.
Forestry 13, 3 hours.	Forestry 14, 3 hours.
Botany 17, 4 hours.	Forestry 12, 2 or 4 hours.
Geology 15, 3 hours.	Zoology 6, 3 hours.
Zoology 20, 3 hours.	

The entire course requires either five or six years of college work, as explained below.

There are two main classes of forestry students:

(A). Those who enter this University as undergraduates with the intention to take the degree of Bachelor of Science in Forestry at the end of their fourth year, and the degree of Master of Science in Forestry at the end of the fifth year.

(B). Those who begin the study of forestry as graduate students (except candidates for the doctorate). Such students require two years to complete the course in forestry, and receive the degree of Master of Science in Forestry.

In addition to the above, there are two other classes of forestry students:

(C). Candidates for the doctorate (Doctor of Philosophy or Doctor of Science) may elect one or both minors in forestry.

(D). Under very exceptional circumstances, special students will be admitted to the work in forestry.

No one (with very rare exceptions in the case of undergraduate special students) will be allowed to complete all the courses in forestry as an undergraduate. At least the last year of work must be taken as a graduate student.

A special bulletin describing the course in forestry, and containing the required program and other details, may be obtained by addressing the Secretary of the University. General correspondence concerning the course may be directed to the Professor of Forestry,

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The University, Ann Arbor. Inquiries concerning entrance requirements or credit for advanced work should be addressed to Acting Dean J. R. Effinger, The University.

Important Notice

Students entering the Department of Literature, Science, and the Arts with the intention of taking the course in Forestry should inform the Committee on Election of that intention, in order that their election of studies may be made in accordance with the prescribed program given above.

All Forestry students entering the University with advanced standing and those transferring from some other course to that of Forestry, should consult the faculty of the Department of Forestry before making their elections.

The course in Forestry is prescribed throughout, and must be taken in the order given above. No deviations may be made from this order except by written permission of the Professor of Forestry.

Before making elections each semester, all Forestry students should advise with a committee of the Forestry faculty appointed for that purpose.

COURSES IN BUSINESS ADMINISTRATION

The Courses in Business Administration are organized as special programs of study in the Department of Literature, Science, and the Arts. Their aim is to give semi-professional training in the organization and processes of modern industry and to assist the student in the selection of such other lines of study, offered in the department, as will give general culture to supplement this training.

Four year programs of study, leading to the bachelor's degree, are now offered in GENERAL BUSINESS, BANKING, INSURANCE, ACCOUNTING, RAILWAY ADMINISTRATION, and MINE ADMINISTRATION. The required work in these varies from 70 to 80 hours and includes various courses in Political Economy, Industrial Technique, Industrial and Social History, Money, Banking and Finance, Commerce and Transportation, Accounting and Business Organization, Insurance and Statistics, Law and Administration, and Applied Science.

Whichever program is chosen, the student must elect Rhetoric 1 and 2 and Mathematics 1 and 2 and a total of 24 hours of modern language. Departures from the printed programs may be made at any time by consent of the Committee.

The privilege of making elections in the Law Department is granted to students enrolled in these courses who have 60 hours of credit with distinctly good grades.

Enrollment should take place at the beginning of the first year and not later than the beginning of the third year of residence. Only candidates for a degree may be enrolled.

Students completing any of the programs laid down will receive, in addition to the University diploma, a special certificate signed by the President of the University.

A special announcement of the Courses in Business Administration may be obtained by addressing the Secretary of the University. Correspondence concerning the courses may be directed to Professor David Friday, 1203 Forest Avenue. Inquiries concerning requirements for entering the University, or credit for advanced work, should be addressed to Acting Dean J. R. Effinger, The University.

COURSE IN LANDSCAPE DESIGN

The course in landscape design is organized as a special program of study in the Department of Literature, Science, and the Arts, and leads to a special degree (Master in Landscape Design). It requires a minimum of five years' college work.

The object of the course is primarily to train professional landscape designers, and hence it includes lines of study which are essential to a liberal college education in addition to the technical studies. One course in the Department of Landscape Design is open to all students in the University.

No one will be allowed to complete all the courses in landscape design as an undergraduate. At least the last year of work must be taken as a graduate student.

The privilege of making certain electives in the Department of Law and the Department of Engineering is granted to students enrolled in this course.

A special bulletin on the Course in Landscape Design, containing the required program and other information, may be obtained by addressing the Secretary of the University. Correspondence concerning the course may be addressed to Assistant Professor Aubrey Tealdi, 1320 South University Avenue, Ann Arbor. Inquiries concerning the requirements for entering the University, or for credit for advanced work, should be addressed to Acting Dean J. R. Effinger, The University.

COURSES IN JOURNALISM

In order to provide training for Journalism, programs of study have been arranged to meet the needs of two classes of students: (A) those who wish to pursue a general course; (B) those who wish to prepare themselves for a particular kind of writing, or a special department of the newspaper. In order to give the candidate an opportunity for practical newspaper experience a limited amount of credit will be granted for work on the student or University publications, provided that such work is elected as regular courses in the department of Rhetoric and is done under the immediate direction of a member of that department.

The administration of the course in Journalism is entrusted to a standing committee of the Faculty, which has the further power to modify the requirements somewhat to meet the aims and special needs of individuals. Upon graduation a special certificate will be given to students who, in covering the requirements for the Bachelor's degree, shall have completed a program of studies approved by this committee.

A special bulletin describing the course may be obtained by addressing the Secretary of the University. Further information concerning the work may be gained by communicating with Professor Fred N. Scott, 1351 Washtenaw Avenue, Ann Arbor. Inquiries concerning entrance requirements or admission on advanced standing should be addressed to Acting Dean J. R. Effinger, The University.

TEACHER'S DIPLOMA AND TEACHER'S CERTIFICATE

The aims of the University in providing instruction in the Science and Art of Teaching are as follows:

1. To fit the University students for the higher positions in the public school service.
2. To promote the study of educational science.
3. To teach the history of education, and of educational systems and doctrines.
4. To secure to teaching the rights, prerogatives, and advantages of a profession.
5. To give a more perfect unity to our State educational system by bringing the secondary schools into closer relations with the University.

Teacher's Diploma

The Teacher's Diploma is given to a student in connection with his bachelor's degree, provided he has taken eleven hours, including Courses 2, 4, 5 (*a, b, c, d, e, or f*), and 13 or 32, in Education.

The Diploma is also given to a graduate student at the time of receiving a master's or a doctor's degree, provided he has pursued teaching as a major or a minor study, or has otherwise satisfactorily completed an equivalent amount of pedagogical work.

Teacher's Certificate

By authority of an act of the State Legislature, passed in 1891 and amended in 1903, the Board of Regents, acting upon the recommendation of the Faculty of this Department, gives a Teacher's Certificate to any person who takes a bachelor's, master's, or doctor's degree, and also receives a Teacher's Diploma as provided above. By the terms of the act, the certificate given by the Regents "shall serve as a legal certificate of qualification to teach in any of the schools of this State, when a copy thereof shall have been filed or recorded in the office of the legal examining officer or officers of the county, township, city, or district."

DIPLOMA OF MERIT

A Diploma of Merit will be granted to a limited number of graduating students who, in the judgment of their instructors, have shown exceptional proficiency in their studies and possess marked qualifications for success in teaching. No specific requirements will be made for this diploma, nor will applications for it be considered.

This diploma must not be confused with the Teacher's Diploma described in the preceding sections. Particular attention is drawn to the fact that it does not entitle the holder to the Teacher's Certificate.

TEACHER'S APPOINTMENT COMMITTEE

An appointment committee of the Faculty of the Department of Literature, Science, and the Arts composed of representatives of the various departments of instruction, has been constituted for the purpose of assisting men and women who are studying, or have studied, under this Faculty, to secure positions as teachers. This service is performed gratuitously, in the interest of students of the University, past or present, and of superintendents of schools and boards of education wishing to employ teachers. Persons desiring to reach this committee should address their communications to the Secretary of the Appointment Committee, The University.

FEES AND EXPENSES

The matriculation Fee and the Annual Fee must be paid in advance, and no student can enter upon his work until after such payment. For the rules governing Second Semester Fees and the refunding of fees see page 95.

Matriculation Fee.—For Michigan students, *ten dollars*; for all others, *twenty-five dollars*.

Annual Fee.—For Michigan students, *forty-two dollars*; for all others, *fifty-two dollars*.

Part Time Fee.—Persons engaged in teaching in public, parochial, or private schools who are regularly admitted as students in the Department of Literature, Science, and the Arts, may elect not more than five hours a week, upon the payment of a fee of *ten dollars* in lieu of the regular annual fees. Such students must pay the matriculation fee the same as other students.

Graduation Fee.—For all alike, *ten dollars*.

Teacher's Diploma Fee.—For all alike, *two dollars*.

Laboratory Fees.—Students who pursue laboratory courses are required to pay for the materials and apparatus actually consumed by them. The deposits required in advance range from one to twenty dollars. In the chemical laboratory the average expense for each course is about one dollar and twenty cents a week.

Gymnasium Fee.—For the rental of a locker in the Gymnasium a fee of two dollars is charged for men, one dollar for women.

For additional information in regard to expenses, see page 93.

COURSES OF INSTRUCTION

The Courses of Instruction are subject to change from time to time. At the opening of each academic year, a special Announcement is issued, giving full information concerning the courses offered for the year, and the days, hours, and places of lecture, recitation, and laboratory work. From the courses offered in the various branches of learning, the student is allowed to make his choice, under regulations described by the Faculty (see page 116).

The courses announced for the year 1913-1914 are described below. The amount of credit toward graduation assigned to each course is indicated by the expression *one hours, two hours, etc.*

ABBREVIATIONS: U. H.—Main Hall of University Hall. N. W.—North Wing of University Hall. S. W.—South Wing of University Hall. T. H.—Tappan Hall. W. H.—West Hall. Ec.—Economics Building. Ph.—Physical Laboratory. Ch.—Chemical Laboratory.

GREEK LANGUAGE AND LITERATURE

The courses marked A, B, are designed for those who have had no opportunity to take Greek before admission, or have not been able to complete the entrance requirements in Greek. A credit of four hours will be given for each one of these courses satisfactorily completed. Students intending to enter upon the study of Greek at any time in their course will find it to their advantage to do so in their first year.

Courses 1 and 2 must precede all the other numbered courses except those grouped below under the heading "Greek Courses in English."

In addition to Courses 1, 2, 3, and 5, students who are preparing to teach Greek are recommended to elect at least twelve hours more under the advice of the instructors in the department.

Consultation hours. The instructors in the department may be consulted as follows:

Professor BONNER: *M, W, F*, at 2. Room 107 T. H.

Assistant Professor WINTER: *Tu, Th*, at 10. Room 107 T. H.

Dr. ROBBINS: *M, W*, at 11, *Tu, Th*, at 3. Room 107 T. H.

Greek

FIRST SEMESTER

Course A. Elementary Greek. *Four hours.* Two sections. Dr. ROBBINS.

No credit towards graduation is counted for this course until Course B is satisfactorily completed.

This course, with its continuation, Course B in the second semester, will enable students to take up Course 1 the following year.

1. Plato, *Apology*; Homer, *Odyssey*, selections. *Four hours.* Assistant Professor WINTER.
3. Selections from the lyric and elegiac poets, and from the history of Herodotus. *Three hours.* Professor BONNER.
- 6a. Historical Greek Grammar. Lectures on Greek Grammar, with special reference to the origin of inflectional forms. *Two hours.* Professor MEADER.
- [7a. Seminary. The History of Herodotus. *Three hours.* Professor BONNER. Omitted in 1913-1914.]
- 7b. Seminary in the Greek Comedy. Selected plays of Aristophanes will be chosen for critical study, and others will be read privately. During the last third of the course the remains of Menander will be studied. Open to graduates only. *Three hours.* Professor BONNER.
9. Xenophon. Introduction of the critical study of the Anabasis. The course is intended primarily for teachers. *Two hours.* Professor BONNER.
- [12. Demosthenes: select orations and studies in the Attic Orators. *Three hours.* Dr. ROBBINS. Omitted in 1913-1914.]
- 12a. Studies in the Attic Orators.
Considerable parts of the text of representative orators of the fourth century will be read, and the political history of the time will be dealt with in lectures and reports. *Three hours.* Dr. ROBBINS.
15. The Bucolic Poets. Theocritus, Bion, and Moschus, with studies in the history of pastoral poetry. *Three hours.* Professor BONNER.

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31. Reviews in Greek Literature, Grammar, and Antiquities. For candidates for the higher degrees. *No credit.* Professor BONNER, Assistant Professor WINTER, and Dr. ROBBINS.

SECOND SEMESTER

Course B. Elementary Greek. Continuation of Course A. Xenophon's *Anabasis* and Greek prose writing. *Four hours.* Two sections. Dr. ROBBINS.

2. Homer, *Odyssey*; continuation of selected readings: Euripides, *Alcestis*. *Four hours.* Assistant Professor WINTER.
5. Greek Drama. Euripides, *Medea*; Aristophanes, the *Frogs*. *Three hours.* Professor BONNER.
- 6b. Greek Prose Composition. *Two hours.* Dr. ROBBINS.
- [8a. Seminary. The History of Herodotus. Continuation of Course 7a. *Three hours.* Professor BONNER. Omitted in 1913-1914.]
- 8b. Seminary in the Greek Comedy. Continuation of Course 7b. *Three hours.* Professor BONNER.
- [11. Lucian. Selected writings. *Two hours.* Assistant Professor WINTER. Omitted in 1913-1914.]
- 11a. Plato's *Phaedo*.
Introductory lectures, studies in Plato's philosophy, and problems in textual criticism. The course will be conducted as a proseminary. *Two hours.* Assistant Professor WINTER.
18. Aeschylus. Selected Plays. *Two hours.* Dr. ROBBINS.
- [22. Greek Lyric Poetry. A study of the remains of Greek lyric poetry exclusive of the epinician odes of Pindar. *Two hours.* Professor BONNER. Omitted in 1913-1914.]
25. Greek Palaeography. *One hour.* Professor _____.

Greek Courses in English

The courses grouped under this head do not require a knowledge of the Greek Language. They are intended for students who have not had time or opportunity to learn Greek, but wish to acquire some knowledge of Greek literature and life, and of the debt which modern civilization owes to the Greeks.

FIRST SEMESTER

16. Greek Literature in English. No knowledge of the Greek language is required for this course. The aim is to give students an acquaintance with the masterpieces of Greek literature from Homer to Theocritus through the medium of English translations. Lectures, assigned readings, and reports. *Three hours.* Assistant Professor WINTER.

- [26. Greek Religion. Lectures, assigned readings, and reports. *Two hours*. Professor BONNER.

This course does not require a knowledge of Greek, but students who have had adequate training in the Greek language may elect it as a three-hour course, the third hour (which will be arranged later) to be devoted to the study of selected subjects from the original sources. Omitted in 1913-1914.]

29. Ancient Greek Life. Dr. ROBBINS. Elect under Classical Art and Archaeology, Course 4.

SECOND SEMESTER

10. The Greek Drama in English Translations. Lectures on the history, development and influence of the Greek drama; assigned readings and reports. No knowledge of the Greek language is required for this course. *Two hours*. Professor BONNER.

14. Greek Mythology. Professor BONNER.
Elect under Classical Art and Archaeology, Course 6.

28. Greek Political Institutions. Lectures, assigned readings, and reports. *Two hours*. Dr. ROBBINS.

This course does not require a knowledge of Greek; but advanced students who have some knowledge of the language may, by arrangement with the instructor, elect a third hour, which will be devoted to the study of the sources in the original.

30. Topography and Monuments of Ancient Athens. Illustrated lectures, and assigned readings. Assistant Professor WINTER.
Elect under Classical Art and Archaeology, Course 8.

JOURNAL CLUB

Analysis and criticism of important articles in the domain of Greek and Latin languages and literatures, Greek and Latin grammar and lexicography, Greek and Roman history, archaeology and antiquities, by members of the classical faculty, and of the Greek and Latin seminars. Fortnightly, throughout the year.

LATIN

Courses A and B are designed for students entering with two units in Latin, and should be elected in the first year. A credit of four hours is given for each course.

Students entering with four units in Latin should elect Courses 1 and 2 in the first year, and 3 and 4 in the second year. Course 6a is also open to second year students.

Third year students may elect from Courses 7, 7a, 10, 11, 12, 14, 14a, and 16a.

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In order to increase the range of work offered to advanced students, several of the courses in Latin are given in alternate years, new courses being introduced as opportunity is thus afforded.

Students who are preparing themselves to teach Latin are recommended to take Courses 7, 10, 11, 12, 21, 21*a*, 22, and 22*a*. It is advised that they complete at least Courses 1 and 2 in Greek, either having presented two units of Greek for admission and having taken Courses 1 and 2 as regular freshman work, or if Greek be not presented for admission, having completed Courses A and B as well as 1 and 2 in the University.

Courses 1, 2, 3, 4, 4*a*, 4*b*, 4*c*, 6, 6*a*, 7, 7*a*, 7*c* are intended primarily for undergraduates. Courses 5*f*, 6*g*, 7, 7*b*, 8, 10, 10*a*, 11, 12, 13, 13*a*, 14, 14*a*, 15, 16, 16*a*, 18, 20, 21, and 22 are for graduates and undergraduates. Courses 18*b*, 24, 25, 26, 27, 28, and 31 are exclusively for graduates.

Consultation Hours.—The instructors in the department will have consultation hours as follows:—

Professor KELSEY, *Tu, Th*, at 9, *W* and *F*, at 10, Memorial Hall.

Professor SANDERS, *Tu, W, Th*, at 3. Room 101, U. H.

Professor MEADER, *Tu, Th*, at 11. Room 102, U. H.

Assistant Professor CRITTENDEN, *Tu, Th*, at 3. Room 103, U. H.

Assistant Professor WINTER, *Tu, Th*, at 10. Room 107, T. H.

FIRST SEMESTER

- Y. Elementary Preparatory Latin. This course, running throughout the year, covers the first two units of the entrance requirement in Latin. Successful completion of the course entitles the student to two units for admission; but no college credit is given. A fee of \$10 is charged for each semester. *One unit.* Dr. BUTLER.
- A. Cicero, Selected Orations. *Four hours.* Assistant Professor CRITTENDEN.
- B. Virgil, *Aeneid*. *Four hours.* Assistant Professor CRITTENDEN.

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- 1. Cicero. *De Senectute, De Amicitia*; Selections from Catullus; Latin Writing. *Four hours.* Three sections. Assistant Professors CRITTENDEN and WINTER.
 - 3. Horace. Selections from the *Odes, Satires, and Epistles*. *Four hours.* Two sections. Professors SANDERS and MEADER. These sections may also be elected as *three hour* courses, 3*a*.
 - 5*f*. General Linguistics. A general introduction to the science of language. *Two hours.* Professor MEADER. This course should be elected as General Linguistics and Comparative Philology, 5*f*.
 - 6*a*. Roman Comedy. Selected plays of Plautus and Terence. *Two hours.* Assistant Professor WINTER.

7. Roman Political Institutions. *Two hours.* Professor SANDERS.
- [7a. Tacitus, *Agricola* and Selections. Assistant Professor WINTER. Omitted in 1913-1914.]
11. Latin Writing. *Two hours.* Two sections. Professors SANDERS and MEADER.
Course 11 is introductory to Course 12. The principal aim is to secure correctness of expression and a feeling for idiom. The course may profitably be taken by students whose work in the Latin writing of Course 1 has been of a high grade.
13. Selections from the Philosophical writings of Cicero. Interpretations and lectures. *Two hours.* Professor KELSEY.
- [13a. Lucretius. Interpretations and lectures. Professor KELSEY. Omitted in 1913-1914.]
14. Tibullus and Propertius. Interpretations, with lectures on the Roman elegy. *Two hours.* Professor SANDERS.
- [14a. Catullus and Martial. Interpretations and lectures. *Two hours.* Professor SANDERS. Omitted in 1913-1914.]
15. Introduction to Latin Palæography. *Two hours.* Professor SANDERS.
Lectures on the various styles of writing found in Latin manuscripts, with exercises in reading from facsimiles.
21. Teachers' Course. Interpretation of Cæsar's *Gallic War*, with studies in the syntax and military antiquities. *Two hours.* Professor KELSEY.
Courses 21, 21a, and 21b, are open only to those who receive special permission. Those who elect Course 21 are required to elect also 21a.
- 21a. Teachers' Course. Lectures on the *Gallic War*. *One hour.* Professor KELSEY.
- 21b. Studies in Cæsar. Consultation. Professor KELSEY. No credit is given for this course.
25. Reports on the Progress of Research. *One hour.* Analysis and criticism of important articles in the domain of the Latin and Greek languages and literatures. Latin and Greek grammar and lexicology. Greek and Roman history, archæology and antiquities, by members of the classical faculty and members of the Latin and Greek Seminaries.
27. Seminary. Studies in Roman Philosophical writers. Professor KELSEY.
Course 27 is open to graduate students only.

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SECOND SEMESTER

- Z. Elementary Preparatory Latin. This course, running throughout the year, covers the first two units of the entrance requirement in Latin. Successful completion of the course entitles the student to two units for admission; but no college credit is given. A fee of \$10 is charged for each semester. *One unit.* Dr. BUTLER.

- B. Virgil, *Aeneid*. *Four hours.* Assistant Professor CRITTENDEN.
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1. Cicero. *De Senectute, De Amicitia*; Selections from Catullus; Latin Writing. *Four hours.* Mr. ———

2. Livy, Book I or XXI. Plautus. Terence. *Four hours.* Three sections. Assistant Professors CRITTENDEN and WINTER.

4. History of Roman Literature. *Four hours.* Sec. I. Lectures and recitations, with reading of selections from representative authors. Professor MEADER.
Sec. II. Lectures and recitations, with readings from the Philippics of Cicero. Professor SANDERS.

- 4a. General Course in Roman Literature. *Two hours.* Two sections. Professors SANDERS and MEADER.

This course is designed for students interested in the general subject of literature, who do not wish to make an intensive study of Latin. No knowledge of Latin is required. The Roman literature will be treated in its broad relation to the Greek literature and to modern literature.

- 4b. The *Letters* of Pliny the Younger. Interpretation of selected letters, with a study of Roman literary and social conditions at the end of the first century, A. D. *Two hours.* Professor MEADER.

- 4c. Cicero, *Philippics*. Readings with historical studies. *Two hours.* Professor SANDERS.

- 6g. Comparative Philology. A general introduction to comparative Indo-European philology. Professor MEADER.
This course should be elected as General Linguistics and Comparative Philology, 6g.

- 7b. Proseminary in Roman Political Institutions. Studies in the Imperial Period. *One hour.* Professor SANDERS.
Graduate students will take this as a *two hour* course.

- 7c. The Histories of Tacitus. Interpretations and Lectures. *Two hours.* Assistant Professor WINTER.

8. Roman Law. See Courses in Roman Law and Jurisprudence.

- 10a. The Topography and Monuments of Ancient Rome. Professor KELSEY. Elect under Classical Art and Archæology. Course 2a.
12. Latin Writing. Advanced Course. *Two hours.* Two sections. Professors SANDERS and MEADER.
In Course 12, attention is given not only to correctness of expression, but also to matters of style and the finer distinctions of the language. It is limited to those whose work in Course 11 has been of a high grade.
16. Latin Inscriptions. *Hours to be arranged.* Professor KELSEY. Reading of inscriptions of different periods from the De Criscio collection and from reproductions. Interpretation of selected inscriptions.
- 16a. The *Letters* of Cicero.
Interpretation of selected letters, with a study of Roman manners and political conditions at the end of the Republic. *Two hours.* Professor SANDERS.
18. Lectures on the Latin Language. *Two hours.* Professor MEADER.
The object of this course is to give the student a scientific basis for the study and teaching of the Latin language. The subjects treated will be: the history of the Latin sounds and inflections; the forms and meanings of the more important syntactical types; Latin word formation.
- [18b. The Italic Dialects. *Two hours.* Professor MEADER.
Lectures and recitations on the phonology, morphology, and syntax of Oscan and Umbrian. Interpretation of inscriptions Omitted in 1913-1914.]
22. Teachers' Course. Virgil. *Two hours.* Professor KELSEY.
Students are required to combine 22a with 22
- 22a. Teachers' Course. Lectures on Virgil. *One hour.* Professor KELSEY.
- 22b. Studies in Virgil. Consultation. Professor KELSEY. No credit is given for this course.
24. Reviews in Roman Literature, Latin Grammar, and Roman Political Institutions. *No credit.* Professors SANDERS and MEADER.
Students who are candidates for advanced degrees in these subjects will be given systematic reviews of them during the second semester.
26. Reports on the Progress of Research. Continuation of Course 25. *One hour.*

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28. Seminary. Latin Philosophical Writers. Continuation of Course 27. Professor KELSEY.
Course 28 is open to graduate students only.

31. Lectures on the Sources of Roman Historians. *Two hours.* Professor SANDERS.

The chief historians, their methods of work, their interrelationships, and final indebtedness to tradition, historical records, or their own memories, will be discussed. Incidentally the historical foundation of much in Roman history will be touched upon. This course is intended primarily for advanced students in Latin and teachers of ancient history.

CLASSICAL ART AND ARCHAEOLOGY

The following courses do not require a knowledge of Greek or of Latin. The large collection of lantern slides and photographs owned by the University makes it possible to illustrate all these courses fully. The collection of casts of ancient sculpture in the Art Gallery is also utilized in the courses in ancient art. A more complete statement of the material at hand for the study of Roman Archaeology is given under the department of Latin.

For courses in Greek and Roman Art, formerly announced here, see the department of Fine Arts.

FIRST SEMESTER

- [3. The Private Life of the Romans. *One hour.* Mr. _____.
Omitted in 1913-1914.]
4. Ancient Greek Life. *Two hours.* Dr. ROBBINS.
Lectures, illustrated with the stereopticon; assigned readings.

SECOND SEMESTER

- 2a. Monumental History of the City of Rome. A survey of the monuments of art of different periods, with special study of the Forum, the Imperial palaces, and other topographical groups of special importance. Lectures, illustrated. *Three hours.* Professor KELSEY.
6. Greek Mythology. *One hour.* Professor BONNER.
Illustrated lectures and assigned readings. Classical myths will be treated with special reference to their influence on modern literature.
8. Topography and Monuments of Ancient Athens. Illustrated lectures and assigned readings. *Two hours.* Assistant Professor WINTER.

GENERAL LINGUISTICS AND COMPARATIVE PHILOLOGY

The courses announced below are designed for students of both ancient and modern languages. They aim to familiarize the students with the general principles and methods of the Science of Language and to present the most important facts in the life and growth of language. Attention is called to the various courses in Psychology and to the course in Phonetics in the department of German.

FIRST SEMESTER

- [5f. Principles of Linguistic Science. *Two hours.* Professor MEADER. This course aims to give a broad general foundation, such as will enable the student or teacher to judge intelligently of the nature of specific phenomena. Among the questions treated will be: the relation of psychology to linguistic science; the nature of language; speech sounds and their changes; changes in the meanings of words; discussion of grammatical categories (noun, verb, mood, etc.); classification of languages; the genesis of speech. Lectures and recitations. Omitted in 1913-1914.]
- [7. Special Problems in Comparative Philology. *One hour.* Professor MEADER. Omitted in 1913-1914.]
- 26. The Psychology of Language. Among the subjects treated are: The laws of thought and language, the history of linguistic theory, language as a form of expression, the genesis of speech, and the psychology of syntax. Lectures and discussions. *Two hours.* Professors PILLSBURY and MEADER. Professor Scott will give four lectures on the genesis of speech.

SECOND SEMESTER

- 2. Etymology and Semantics. Primarily for graduates. *Hours to be arranged.* Professor MEADER.
- 6g. Comparative Philology. Lectures and Recitations. *Two hours.* Professor MEADER.
A general introduction to comparative Indo-European philology. Study of the chief characteristics of the Indo-European languages, their relationships and classification, the origin and development of their sounds and inflections, accent and vowel gradation, comparative syntax.
- 26c. General Course in Experimental Phonetics. Lectures and laboratory work. This course, which is designed for students of psychology, language, oratory and music, will deal with the anatomy and physiology of the human voice, the production of speech sounds, description and classification of sounds, mechanical methods of recording speech sounds, study of speech records. As the number of students admitted to this course will be small, those desiring to elect it are advised to apply early to one of the instructors in charge. *One hour.* Professors MEADER and SHEPARD.

SANSKRIT

The study of Sanskrit is of value to students of the Indo-European (1) languages, (2) literatures, (3) philosophy and religion, (4) social institutions, and (5) for those preparing to do missionary work in India. The courses offered below are designed especially for students of the languages, ancient and modern, and are adjusted to the needs of those preparing to teach. They are correlated with the courses in Comparative Philology, but individual aid and direction will be given to any who wish to devote themselves to other aspects of the study.

Before beginning the study of Sanskrit, the student should have pursued courses in one of the three subjects, Greek, Latin, and German, or in lieu of German some one of the other Teutonic languages or a Slavonic language for at least four semesters.

FIRST SEMESTER

1. Beginners' Course. Grammar, and exercises in translation and composition. Text-books: Whitney's *Grammar* or Thumb's *Handbuch des Sanskrit* and Lanman's *Sanskrit Reader*. *Two hours*. Professor MEADER.
3. Advanced Reading: Kalidasa's *Cakuntala*. Elements of Prakit. *One hour*. Professor MEADER.
- 3a. Rapid Reading of Easy Sanskrit. *One or two hours*. Professor MEADER.

SECOND SEMESTER

2. Interpretation of selections contained in Lanman's *Sanskrit Reader*, with elementary studies in the comparative morphology of the more important cognate languages. *Two hours*. Assistant Professor MEADER.
4. Advanced Reading. Selections from the *Vedas*. *One hour*. Assistant Professor MEADER.

OLD BULGARIAN

FIRST SEMESTER

1. Beginners' Course. *Two hours*. Professor MEADER.
This course is designed for students interested either in Slavonics or in Indo-European comparative philology.

RUSSIAN

In consequence of the increasing importance of Russia in intellectual, political and commercial activities, a practical acquaintance with the Russian language is rapidly becoming a necessity for English-speaking peoples. The courses offered below are especially designed for students interested in Russian literature, Russian historical sources and Indo-European comparative philology, and for those who are preparing to enter the diplomatic service.

FIRST SEMESTER

1. Beginners' Course. Elements of the language. Selected readings from Tolstoi will serve as the basis of the semester's work. *Three hours.* Professor MEADER.
2. Continuation of Course 1. Readings from Pushkin, Lermontov, Turgenyev, and Tolstoi. *Three hours.* Professor MEADER.
8. Russian Literature in English. No knowledge of the Russian language is required. Courses 8 and 9 are continuous in character and should be elected consecutively, as each is essential to the understanding of the other. They are designed for those who desire to pursue the study of the literature under the guidance of an instructor, without devoting time previously to the acquisition of the language. Course 8 deals mainly with the Age of Catharine, Pushkin, Gogol, Dostoevski, and Turgenyev; Course 9 with Tolstoi, Nekrasov, Chekhov, Gorki, and Andreev.

The attention of students who are especially interested in literature in its broader aspects, such as literary criticism, comparative literature, etc., is called to Course 16 in Greek, 22, 24, 26, 28 in Semitic Literature, 34 in French, 3 in Norwegian Literature, 24 in English, 7, 8 in Rhetoric, and 6, 16 in Philosophy. Lectures and assigned readings. *Two hours.* Professor MEADER.

SECOND SEMESTER

3. Advanced Russian. Gogol and Tolstoi. *One or two hours.* Professor MEADER.
9. Continuation of Course 8. *Two hours.* Professor MEADER.

SEMITICS AND HELLENISTIC GREEK AND STUDIES IN ENGLISH BIBLE

- a. Hebrew.
- b. Assyrian and Sumerian.
- c. Arabic.
- d. Aramaic, syriac, Ethiopic.
- e. Hellenistic Greek.
 - a. New Testament Greek.
 - b. Septuagint, Josephus.
- f. Lectures on Semitic History and Literature.

The Courses in Semitics are intended: (1) For students who are seeking a liberal culture; (2) for students of classical and modern languages to furnish them with necessary data for the study of the philosophy of language and phonetic laws; (3) for students who wish to make a special study of Semitics (the courses lead to the degree of Doctor of Philosophy); (4) for students of ancient history; (5) for students of art and archaeology; (6) for students of ethics and theology; (7) for students who expect to enter upon missionary service in the orient; (8) for those who look forward to mercantile relations or consular service.

Students who intend to pursue theological studies are advised to consult the head of the department as to the lines of study which may be pursued with greatest advantage in connection with Semitics, and as a preparation for the work of the theological seminary.

- (1) Consultation and enrollment: October 1 and 2, 9-12 A. M. Room 102, U. H.
- (2) Students may enter the study of Hebrew in their Sophomore year, and those who intend to enter a theological seminary, or make a special study of Semitics, are advised to begin early in their course.

Students who have taken Hebrew and Hellenistic (New Testament) Greek for four semesters, are allowed special privileges in several of the theological seminaries. *Note the following:—*

- (1) They may graduate in two years, thus saving a whole year; or,
- (2) They are permitted to enter upon advanced courses for which they would not, otherwise, be prepared. They are thus enabled to gain a commanding knowledge of the *Literature of the Bible* which is impossible to students who are compelled to spend a large portion of their junior and middle years in the seminary in the purely academic work of learning languages, and, further, are enabled to enter into competition for the large fellowships offered by the seminaries for foreign study.

Hellenistic Greek

In general, it may be said that the work is arranged, as nearly as possible, to meet the needs and wishes of applicants.

It should be borne in mind that one of the most invaluable aids to the study of the diction of the *New Testament* is a knowledge of Hebrew, and that a knowledge of Semitic thought and modes of thought is indispensable to an adequate comprehension of the *New Testament* literature.

FIRST SEMESTER

1. *New Testament. The Acts of the Apostles*, and historical introduction to the Apostolic period. Text-books: Westcott and Hort's *Greek New Testament*, revised edition, with introduction by Ph. Schaff; Winer's *New Testament Grammar*; Blass's *New Testament Grammar*; Thayer's *Greek-English Lexicon*. *Two hours*. Professor FRENCH.
3. The Gospels according to Mark, Luke, and John, including grammatical study of Hellenistic Greek. Text-books as in Course 1. *Two hours*. Professor FRENCH.

SECOND SEMESTER

2. *I Corinthians, II Corinthians*. Text-books the same as in first semester. *Two hours*. Professor FRENCH.
4. *I and II Thessalonians, Ephesians, Colossians*. *Two hours*. Professor FRENCH.

Hebrew

FIRST SEMESTER

5. *Genesis*, Baer and Delitzsch's Text. Gesenius's *Hebrew Lexicon*. Davidson's *Introduction to Hebrew Grammar*. Three hours. Professor FRENCH.
7. The minor Prophets, *Amos*, *Hosea*, and *Isaiah*, Chaps. I-XXXV. Two hours. Professor FRENCH.
9. Prophetic Literature. *Isaiah*, Chaps. XI-XLVI, and study of the modern literary criticism of the *Book of Isaiah*. Text-books: *Hebrew Bible*, Driver's *Hebrew Moods and Tenses*.

SECOND SEMESTER

6. *Deuteronomy*, *Joshua*, *I Samuel*, *Ruth*, *Jonah*. Theile's *Biblia Hebraica*. Gesenius's *Hebrew Lexicon*. Müller's *Outlines of Hebraic Syntax*. Three hours. Professor FRENCH.
8. The *Book of Job*, including study of the literary structure and critique of the dominant ideas. Text-books: Baer and Delitzsch's Text and Haupt's Polychrome Edition (Text by Siegfried). Two hours. Professor FRENCH.

Assyrian

FIRST SEMESTER

11. Introduction to Easy Historical Inscriptions from the Ninth Century B. C., with study of the Grammar. Text-book: Delitzsch's *Assyrische Lesestücke*, vierte Auflage. Three hours.
13. The Babylonian Stories of Creation; the Deluge and the War of Marduk against Tiāmit; lectures on the Cosmology of the Babylonians; Inspection of Tiglathpileser I, cir. 1120 B. C. Two hours.

SECOND SEMESTER

12. Historical Inscriptions. Selections from the Cuneiform Inscriptions of Western Asia (R. I-V). Three hours.
14. Religious Literature. Texts: King's *The Prayers of the Lifting up of the Hand*, and Craig's *Religious Texts*. Two hours.

Arabic

FIRST SEMESTER

15. Introductory Course. Grammar and Reading. Text-books: Socin's *Arabic Grammar* (English ed.) and Brünnow's *Chrestomathy*. Two hours.
17. Selected Suras from the Qur'ân, with introductory lectures on the life of Muhammed and Muhammedanism. Two hours.

Aramaic, Syriac and Ethiopic

Courses in Aramaic, Syriac, and Ethiopic are given to students of advanced standing. The Aramaic parts of the *Old Testament* (*Dan.* 2:4-7:28; *Ezra* 4:8-6:18; and 7:12-26) are read in conjunction with the study of Aramaic Grammar. Hebrew, Assyrian, Arabic, and Aramaic should, however, ordinarily be pursued before taking up Syriac and Ethiopic.

Semitic History and Literature

Students who wish to take the courses of the second semester are advised to take Course 19, offered in the first semester.

FIRST SEMESTER

19. Lectures. The beginnings of history and civilization, and the history of Babylonia and Assyria, from the earliest historical period, cir. 4500 B. C., down to the Fall of Nineveh and Babylon. Text-book: *History of Babylonia and Assyria* by Winckler, translated and edited by J. A. Craig. *Two hours.*

This course is based upon the monuments, and offers an outline a history of those ancient peoples, sketching their earliest organization, forms of government, social and religious life, art, science, and literature, showing the conspicuous part they have performed in the history of the world, and the dominance of their influence in our own era.

The lectures will be illustrated by 200 lantern views, numerous photographs, photolithographs, and original tablets and casts.

21. The History of Israel and Judah from the Conquest to the Fall of the Northern Kingdom under Sargon, 722 B. C. *Two hours.*
This course, with its sequel (No. 20), is based upon the literary analysis of the historical books of the *Old Testament*, and extra-Israelitish sources, especially the monuments of Nineveh and Babylon.

23. The Religion of the Semitics. A general study of Semitic religion, with more especial attention to the religion of the Hebrews and of the Babylonians. *Two hours.*

This course is especially designed for students of literature, theology, and philosophy. It deals with the primitive, and, therefore, historically fundamental concepts of the Semitic religion, out of which grew the three great religions, Judaism, Christianity, and Muhammedianism. It should also prove valuable to students of literature generally, since theology, which is the philosophy of religion, holds so large a place in literature.

25. Study of the Hexateuch—*Genesis* to *Joshua* included. *Two hours.* Professor FRENCH.

The object of this course is to explain the literary origin of these books and to set forth the conclusions of modern *Old*

Testament scholarship respecting them. Special attention will be given to Chapters 1-10 of *Genesis* and the Babylonian *Cosmologies* to which they are obviously related. The legal codes will be examined and compared with the great Code of the Babylonian ruler and law-giver, *Chammurabi*, cir. 2200 B. C. This code, the most important archæological find of many years, was discovered in 1901-1902. It reveals the state of society in Babylon 4,000 years ago.

27. The Study of Minor Prophets, Amos and Hosea, and of the prophecies of Isaiah. (*Isa.*, Chapters 1-35) and of Isaiah's younger contemporary, Micah. *Two hours.* Professor FRENCH.

SECOND SEMESTER

20. The History of Judah from the Fall of the Northern Kingdom to the Babylon Exile, 586 B. C., and of the Jewish State from (1) the Exile to the establishment of the Congregation under Ezra, 444 B. C., (2) from Ezra until Alexander of Macedon, 336 B. C., (3) from Alexander until Antiochus IV, 175 B. C. (4) from Antiochus IV to the destruction of the state with the Fall of Jerusalem, 70 A. D. *Two hours.*
22. The Study of *Deutero-Isaiah* (*Isa.*, Chapters 40-66), *Jeremiah*, *Jonah*, *Nahum*, and *Daniel*. Only one lecture will be devoted to each of the last three books named. *One hour.*
24. The Study of the *Wisdom Literature* of the *Old Testament*, with special discussion of the *Book of Job*; its kinship to and contrasts with the great skeptical dramas of other literatures: The *Prometheus* of Aeschylus, Goethe's *Faust*, and Shakespeare's *Hamlet*. *Two hours.*
26. Lectures on the Literature of the New Testament. *Two hours.* Professor FRENCH.
An analysis of the Pauline Epistles is given, the fundamental teaching is summarized and the arguments by which the conclusions are reached are clearly set forth. The circumstances under which the churches were founded and the conditions which called forth the letters are discussed. The course is conducted upon historical and literary principles with the sole object of discovering the author's thought.
28. Lectures on the Qur'ân and Muhammedanism. Ancient Arabia, The rise of Islâm. The religion of Islâm. History of the Qur'ân. Exegesis of selected surahs of the Qur'ân according to native commentators. No knowledge of Arabic is necessary. *Two hours.* Professor FRENCH.
30. Lectures on the growth of the New Testament Canon, the ancient manuscripts, and the origin of the Gospels from the literary point of view as set forth by the most competent investigators and specialists in the New Testament field. *Two hours.*

ROMANCE LANGUAGES AND LITERATURES

French

Courses 1, 2, 3, 4, must precede all others. Students in these courses are expected to remain in the same section throughout the year, and should choose their section accordingly. Students intending to enter upon the study of French at any point of their course will find it greatly to their advantage to do so in their first year.

Students who have had one year of French in preparation for the University should elect Course 2; those who have had three years should elect Course 4.

Students desiring to become teachers of French should consult Professor CANFIELD as soon as possible. Only students who have marked linguistic ability are encouraged to prepare themselves for teaching, and no student who has not been more than ordinarily successful in his work in the department, and acquired more than an average proficiency, will be recommended.

FIRST SEMESTER

Primarily for Undergraduates.

1. Elementary Course. Grammar and easy reading, with practice in speaking. *Four hours.* Twelve sections. Professors CANFIELD and LEVI, Mr. McLAUGHLIN, Dr. AUSTIN, Dr. FAY, Mr. WANN, Mr. BURSLEY, and Mr. MARSTELLER.
No credit toward graduation is counted for this course until Course 2 is satisfactorily completed.
2. Elementary French. Continuation of Course 1. For those who have had Course 1, or one year of French in the high school. *Four hours.* Mr. WANN.
3. Elementary French of the second year. May be taken as 3, *four hours*, or 3a, *five hours*.
3. Modern prose and plays, with practice in speaking and writing. *Four hours.* Six sections. Professor LEVI, Mr. McLAUGHLIN, Dr. AUSTIN, Dr. FAY, Mr. WANN, and Mr. MARSTELLER.
- 3a. Modern prose and plays, with special emphasis on speaking and writing. *Five hours.* Mr. TALAMON.
Recommended for those who expect to specialize in French.
4. Modern prose and plays. Continuation of Course 3. For those who have taken Course 3, or three years of French in the high school. *Four hours.* Mr. McLAUGHLIN.
5. Introduction to French literature. Representative authors of various periods. *Three hours.* Three sections. Professors LEVI and EFFINGER, and Mr. TALAMON.
One section will be conducted entirely in French.
This course is a prerequisite to all advanced courses in French literature.

7. Composition. Must accompany Course 5 or have been preceded by it. *Two hours*. Two sections. Mr. McLAUGHLIN and Mr. TALAMON.
- [9. French Society and Culture in the Sixteenth, Seventeenth, and Eighteenth Centuries. A survey of the principal factors that contributed to the formation, development, and decay of the classical ideal in French literature. *Three hours*. Professor THIEME. Omitted in 1913-1914.]
11. Voltaire. Reading of selected works, lectures, and reports. *Two hours*. Professor CANFIELD.
13. Conversation. These courses are intended to accompany and supplement the other courses. *One hour credit*.
- 13a. Open to students taking Courses 3 or 4. Two sections. Dr. FAY and Mr. WANN.
- 13b. Open to students taking Courses 5, 7, 9 or 11. Mr. WANN.
- 13c. Open to students having had three years of French. Mr. TALAMON.
15. Advanced French Composition. Practice in writing idiomatic French. *Two hours*. Mr. TALAMON.

For Undergraduates and Graduates.

17. The Dramatic Literature of the Eighteenth Century. A study of the dramatic work of LeSage, Marivaux, Crébillon, Voltaire, Diderot, Nivelle de la Chaussée, Beaumarchais and the minor dramatic authors of the time with reference to the evolution of dramatic form. Lectures in French, with assigned readings and reports. *Two hours*. Professor EFFINGER.
19. The Renaissance in France. A study of the literature of the sixteenth century with special emphasis on Rabelais, Montaigne and the poets of the *Pléiade*. *Two hours*. Mr. McLAUGHLIN.
21. Poetry of the Nineteenth Century.
This course deals with the main aspects of poetry in France from the beginnings of Romanticism to the present time. The chief and representative poets are studied in connection with the currents of thought of the time. Lectures, reading, and discussions. Open to undergraduates and graduates. *Two hours*. Professor CANFIELD.
25. The History of French Literature from its beginnings to the Renaissance. *Two hours*. Professor CANFIELD.
This course aims to give the student some acquaintance with the main and characteristic forms of the literature of the Middle Ages, and of the movement of ideas that found expression in it.
27. Maurice Maeterlinck. A study of his essays and dramas. Readings, lectures, and reports. *Two hours*. Professor LEVI.

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Primarily for Graduates.

29. Proseminary in French Literature. *Two hours, to be arranged.*
Professor CANFIELD.
The work will consist in special studies connected with the works of early Romanticism. In 1913-1914 the early works of Victor Hugo will be the subject of study.
31. Historical French Grammar, I. Phonology. Lectures, with illustrative Old French readings. *Two hours.* Professor CANFIELD.
33. Introduction to Old French Literature. Reading of selected texts and lectures. *Two hours.* Dr. FAY.
- [35. French Versification. A critical and historical study of French verse structure from its origin to the present. *Two hours.* Professor THIEME. Omitted in 1913-1914.]
37. Journal Club. Review of results of current research in the field of the Romance languages and literatures, by the instructors of the department and advanced students. Every other week.

SECOND SEMESTER

Primarily for Undergraduates.

1. Elementary Course. Grammar and easy reading, with practice in speaking. *Four hours.* Mr. _____.
No credit toward graduation is counted for this course until Course 2 is satisfactorily completed.
2. Elementary Course continued. Reading of modern prose and plays, with practice in speaking and composition. *Four hours.* Twelve sections. Professors CANFIELD and LEVI, Mr. McLAUGHLIN, Dr. AUSTIN, Dr. FAY, Mr. WANN, Mr. BURSLEY, and Mr. MARSTELLER.
3. Elementary French. Continuation of Course 2; also for students who have had two years of French in the high school. *Four hours.* Mr. WANN.
4. Elementary French of the second year. May be taken as 4, *four hours* or 4a, *five hours*.
4. Modern prose and plays, with practice in speaking and writing. *Four hours.* Six sections. Professor LEVI, Mr. McLAUGHLIN, Dr. AUSTIN, Dr. FAY, Mr. WANN, and Mr. MARSTELLER.
- 4a. Modern Prose and plays, with special emphasis on speaking and writing. *Five hours.* Mr. TALAMON.
- 5a. Continuation of Course 4. *Four hours.* Mr. McLAUGHLIN.
6. Introduction to French Literature. Continuation of Course 5. *Three hours.* Three sections. Professors LEVI and EFFINGER, and Mr. TALAMON.
One section will be conducted entirely in French.
This course is a prerequisite to all advanced courses in French literature.

8. Composition. Continuation of Course 7. Must accompany Course 6 or have been preceded by it. *Two hours. Two sections.* Mr. McLAUGHLIN and Mr. TALAMON.
- [10. Continuation of Course 9. French Society and Culture in the Sixteenth, Seventeenth, and Eighteenth Centuries. *Three hours.* Professor THIEME. Omitted in 1913-1914.]
12. Rousseau. Reading of selected works, lectures, reports. *Two hours.* Professor CANFIELD.
14. Conversation. These courses are intended to accompany and supplement the other courses. *One hour credit.*
- 14a. Open to students taking courses 4 or 5a. *Two sections.* Dr. FAY and Mr. WANN.
- 14b. Open to students taking courses 6, 8, 10 or 12. *Two hours.* Mr. WANN.
- 14c. Open to students having had three years of French. *Two hours.* Mr. TALAMON.
16. Advanced French Composition. Continuation of Course 15. May also be elected by properly qualified students who have not taken Course 15, after consultation with instructor. *Two hours.* Mr. TALAMON.
- 28a. French reading for students of Biology. See Zoology, Course 28a.

For Graduates and Undergraduates.

18. The Dramatic Literature of the Nineteenth Century. The Melodramas of Pixérécourt; the Romantic drama; Scribe; the classical reaction; Dumas fils, Angier, Henri Becque and the modern school. Lectures in French, with assigned readings and reports. *Two hours.* Professor EFFINGER.
20. The Renaissance in France. Continuation of Course 19. *Two hours.* Mr. McLAUGHLIN.
22. The Poetry of the Nineteenth Century. Continuation of Course 21. *Two hours.* Professor CANFIELD.
24. Teachers' Course. A discussion of the aims and methods of the teaching of French in the secondary school, and a general view of the elements of grammar from the standpoint of the needs of elementary instruction. *One hour.* Professor CANFIELD.
26. The History of French Literature from its beginnings to the Renaissance. Continuation of Course 25. *Two hours.* Professor CANFIELD.
28. The Works of Edmond Rostand, with special reference to *Chantecler*. *Two hours.* Professor LEVI.

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Primarily for Graduates.

30. Proseminary in French Literature. Continuation of Course 29. *Two hours.* Professor CANFIELD.
32. Historical French Grammar, II. Morphology. Lectures. *Two hours.* Professor CANFIELD.
34. Provençal. Outline of the Grammar, with readings in Appel's *Provenzalische Chrestomathie*. *Two hours.* Mr. ———.

Italian

FIRST SEMESTER

1. Italian Grammar, Easy Prose. *Three hours.* Dr. AUSTIN.
No credit towards graduation is counted for this course until Course 2 is satisfactorily completed.
3. Dante. *La Vita Nuova* and *La Divina Commedia*. Lectures and recitations. *Two hours.* Dr. AUSTIN.

SECOND SEMESTER

2. Continuation of Course 1. Modern readings. *Two hours.* Dr. AUSTIN.
4. Dante. *La Divina Commedia*. Continuation of Course 3. Lectures and recitations. *Two hours.* Dr. AUSTIN.

Spanish

FIRST SEMESTER

1. Elementary Course. Grammar and easy reading. *Four hours.* Three sections. Professor WAGNER and Mr. BURSLEY.
Students who have had no French or Latin should consult the instructor before electing Spanish 1. No student is allowed to begin the study of any other language at the same time with Spanish.
No credit towards graduation is counted for this course until Course 2 is satisfactorily completed.
3. Authors of the Nineteenth Century. Reading of selected works by Larra, Becquer, Alarcón, Perez Galdós and Palacio Valdés. *Two hours.* Professor WAGNER.
5. Composition and Conversation. *Two hours.* Professor WAGNER.
Course 5 must be preceded by Courses 1 and 2 or their equivalent.
Courses 3 and 5 may be conveniently taken together, and it is advised that this be done when possible.
4. The *Don Quixote*. The whole of this text is read in the class, and discussed in its relation to Spanish life and literature of the Golden Age. *Three hours.* Professor WAGNER.
Open to students who have completed Course 3a or the equivalent.

- 4a. The Drama of the Seventeenth Century. *Two hours.* Professor WAGNER.
Open to students who have completed Courses 4 and 4b, or an equivalent.
7. Outlines of the History of Spanish Literature. *One hour.* Professor WAGNER.
Primarily a graduate course. May be elected only after consultation with the instructor.
9. Old Spanish Grammar and Readings. *One hour.* Professor WAGNER.
Primarily a graduate course. May be elected only after consultation with the instructor.

SECOND SEMESTER

2. Elementary Course. Continuation of Course 1. Reading of modern prose, with practice in speaking and writing. *Four hours.* Three sections. Professor WAGNER and Mr. BURSLEY.
- 3a. Authors of the Nineteenth Century. Continuation of Course 3. *Two hours.* Professor WAGNER.
6. Composition and Conversation. Continuation of Course 5. *Two hours.* Professor WAGNER.
- 4b. The *Don Quixote*. Continuation of Course 4. *Three hours.* Professor WAGNER.
- 4c. The Drama of the Seventeenth Century. Continuation of Course 4a. *Two hours.* Professor WAGNER.
8. Outlines of the History of Spanish Literature. Continuation of Course 7. *One hour.* Professor WAGNER.
10. Old Spanish Grammar and Readings. Continuation of Course 9. *One hour.* Professor WAGNER.

GERMANIC LANGUAGES AND LITERATURES

German

Courses 1, 2, 3 and 4, or their equivalent, must precede all other courses in German. The work in these courses is laid out on the basis of an entire academic year, and it is expected that the student will not change instructor or section at the end of the first semester without consulting the head of the department. Students intending to begin the study of German in the University are strongly advised to do so in their first year.

The prerequisites for Courses 5-10 are specifically designated under the courses described.

All courses beyond 10 are advanced undergraduate and graduate courses, and should be elected only after consultation with the instructors.

Students who have had one year of German in the high school and wish to pursue the study in the University should elect Course 2.

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Students who have had two years of German in the high school should elect Course 3, 3*a*, or 3*e*.

Students who have had three years of German in the high school should usually elect Course 4. In some cases, however, it may be advisable for them to elect Course 5*a* or some other third-year electives. All such students are therefore urged to consult the head of the department in regard to their elections in German.

Students who have had four years of German in the high school are strongly advised to elect Courses 5*a* and 5*b*.

Students intending to prepare themselves to teach German are strongly advised to elect at least one course under 5 and 6, and Courses 9, 10, 13, 14, 17, 18 and 26. All such students are urged to consult Professor WINKLER (Room 203, U. H.) as soon as possible for the more careful adjustment of their work in German.

A course in the reading of German for students of Biology is announced under the head of Zoology, Course 28. Students wishing to select this course should have completed courses 3*e* and 4*e* or their equivalent.

For consultation hours of the various instructors see the bulletin boards at the doors of the German rooms.

FIRST SEMESTER

1. Elementary Course. Pronunciation, grammar, easy readings, with practice in speaking and writing German. *Four hours.* Seven sections. Professor HILDNER, Assistant Professor DIETERIE, Dr. FEY, Mr. SCHUESSLER, Mr. WAHR, and Mr. MACKENSEN.
2. Elementary Course. Continuation of Course 1. Grammar, descriptive prose, short stories, with practice in speaking and writing German. *Four hours.* Mr. WAHR.
3. Modern Prose, narrative and dramatic, with practice in speaking and writing German. Reviews in German grammar. *Four hours.* Eight sections. Assistant Professor FLORER, EGGERT, and DIETERIE, Dr. FEY, Mr. SCHUESSLER, Mr. WAHR, Mr. MACKENSEN, and Mr. WEIGAND.
- 3*a*. German Prose. Readings from Representative Modern Authors. *Four hours.* Two sections. Assistant Professor SCHOLL and Mr. SCHUESSLER.

This course is designed primarily for students who wish to acquire facility in reading modern German. Prerequisite: Two years of German in the high school or one year of German (Courses 1 and 2) in the University.
- 3*e*. Scientific German. *Four hours.* Assistant Professor SCHOLL.

This course is designed especially for students who intend to enter the Department of Medicine and Surgery. Prerequisite: Two years of German in the high school or one year of German (Courses 1 and 2) in the University.

4. Selected Dramas from Lessing, Goethe or Schiller, with collateral readings. Reviews in German grammar and practice in reading and writing German. *Four hours.* Mr. WAHR.
5. Third-year Electives.
- 5a. Schiller's *Wallenstein* with collateral readings. *Three hours.* Six sections. Professors WINKLER, BOUCKE, DIEKHOFF, and HILDNER, and Assistant Professor FLORER.
Prerequisite: Courses 3 and 4, or their equivalent.
- 5b. Reviews in German Grammar and Exercises in Composition. *One hour.* Five sections. Assistant Professor FLORER and Mr. WEIGAND.
Prerequisite: Courses 3 and 4, or their equivalent.
- 5d. Selected Readings from Goethe's Classic Prose: *Dichtung und Wahrheit, Italienische Reise*, etc. *Two hours.* Assistant Professor SCHOLL.
Prerequisite: Courses 3 and 4, or their equivalent.
7. Contemporary German Novels and Dramas.
Sec. I. Contemporary German Novels: Sudermann, Frenssen, Otto Ernst, etc. Readings and discussions. *Two hours.* Assistant Professor FLORER.
Sec. II. Contemporary German Dramas: Sudermann, Hauptmann, Heyse, etc. A general reading course. *Two hours.* Assistant Professor FLORER.
Prerequisite: Courses 3 and 4, or their equivalent.
- 7b. Scientific German. *Two hours.* Assistant Professor SCHOLL.
Prerequisite: Courses 3e and 4e, or their equivalent.
9. German Composition. *Two hours.* Five sections. Professor HILDNER, Assistant Professors EGGERT, SCHOLL, and DIETERLE, and Mr. FEY.
Prerequisite: Courses 3 and 4, or their equivalent.
- 9a. Advanced German Composition. *Two hours.* Professor DIEKHOFF.
Only students who have successfully passed Courses 9 and 10, or their equivalent are eligible for this course.
- 9b. German Conversation. *Two hours.* Two sections. Dr. FEY.
- 9c. German Conversation. Advanced Course. *Two hours.* Two sections. Assistant Professor DIETERLE.
Students to be eligible for this course must have taken some third-year electives in German or their equivalent.
11. Teachers' Course. Practical work and discussions on grammar, composition, and the reading material now used in the high schools. Intended primarily for seniors. *Two hours.* Professor HILDNER.
13. German Grammar. Lectures on Phonology, Word Formation, and Inflection. Advanced course intended for undergraduates and graduates, particularly prospective teachers of German. *Two hours.* Professor DIEKHOFF.

15. Goethe's *Faust*. Part I. Lectures and recitations. Thomas' edition. *Two hours*. Two sections. Professors WINKLER and BOUCKE.
Prerequisite: Some third-year electives, or their equivalent.
17. History of German Literature. From the earliest times to the end of the Middle Ages. Lectures and Thomas' Anthology of German Literature. *Two hours*. Two sections. Professors WINKLER and BOUCKE.
19. The Beginnings of the Romantic Movement in Germany in its relation to German Classicism and to the social, political and philosophical thought of the times. Advanced course open to undergraduates and graduates. *Two hours*. Professor WINKLER.
- 19a. History of German Literature from 1848-1900. Lectures, discussions and reports. Advanced course open to undergraduates and graduates. *Two hours*. Professor BOUCKE.
21. Heinrich Heine. A comprehensive study of his life and works. Lectures and reports on assigned topics. Advanced course open to undergraduates and graduates. *Two hours*. Professor BOUCKE.
- 21a. Modern Art and Culture, with special emphasis upon the correlation of literary and art movements of modern Germany. Lectures, discussions and reports. *Two hours*. Professor BOUCKE.
23. The Dramatic Works of Friedrich Hebbel. Lectures, discussions and reports on assigned topics. *Two hours*. Professor HILDNER.
Prerequisite: Some third-year electives or their equivalent.
- 23b. Franz Grillparzer. His Life and Works. Lectures, discussions and reports on assigned topics. *Two hours*. Assistant Professor EGGERT.
Prerequisite: Some third-year electives or their equivalent.
24. Studies in the History of the German Novel with special emphasis upon recent German Literature. Lectures, reports and discussions. *Two hours*. Assistant Professor FLORER.
Prerequisite: Some third-year electives or their equivalent.
27. Introduction to Middle High German. Lectures and recitations. Paul's *Mittelhochdeutsche Grammatik* and Bachmann's *Mittelhochdeutsches Lesebuch*. Advanced course open to undergraduates and graduates. *Two hours*. Professor DIEKHOF.
- 27a. Middle High German Literature. A survey of German Literature from 1100-1500. Golther, *Die deutsche Dichtung im Mittelalter*. Selected readings from the most important works of this period. Primarily for graduates. *Two hours*. Professor DIEKHOF.

29. Old High German. Lectures and recitations based upon Braune's *Abriss der Althochdeutschen Grammatik* and reading of selections from Braune's *Althochdeutsches Lesebuch*. Primarily for graduates. *Two hours*. Assistant Professor EGGERT.
39. Seminaries in the German Classics. A comprehensive study of the lives and works of Goethe and Schiller, with investigations of selected topics. Primarily for graduates.
 - a. Goethe. *Two hours*. Professor BOUCKE.
 - b. Schiller. *Two hours*. Professor WINKLER.Instead of the Seminary in Schiller, a Seminary in Herder may be given in 1913-1914.

SECOND SEMESTER

1. Elementary Course. Pronunciation, grammar, easy readings with practice in speaking and writing German. *Four hours*. Mr. WAHR.
No credit towards graduation is counted for this course until Course 2 is satisfactorily completed.
2. Elementary Course. Continuation of Course 1. Grammar, descriptive prose, short stories, with practice in speaking and writing German. *Four hours*. Seven sections. Professor HILDNER, Assistant Professor DIETERLE, Dr. FEY, Mr. SCHUESSLER, Mr. WAHR, and Mr. MACKENSEN.
3. Modern Prose, narrative and dramatic, with practice in speaking and writing German. Reviews in German grammar. *Four hours*. Mr. WAHR.
4. Selected Dramas from Lessing, Goethe, or Schiller. Reviews in German grammar and practice in reading and writing German. *Four hours*. Eight sections. Assistant Professors FLORER, EGGERT, and DIETERLE, Dr. FEY, Mr. SCHUESSLER, Mr. WAHR, Mr. MACKENSEN, and Mr. WEIGAND.
- 4a. German Prose. Readings from Representative Modern Authors. Continuation of Course 3a. *Four hours*. Two sections. Assistant Professor SCHOLL and Mr. SCHUESSLER.
- 4e. Scientific German. Continuation of Course 3e. *Four hours*. Assistant Professor SCHOLL.
6. Third-year Electives.
- 6a. Goethe's *Iphigenie* and Lessing's *Nathan der Weise*, with collateral readings. *Three hours*. Six sections. Professors WINKLER, BOUCKE, DIEKHOFF, and HILDNER, and Assistant Professor FLORER and EGGERT.
Prerequisite: Courses 3, 4 and some elective or electives in 5 in German.
- 6b. Reviews in German Grammar and Exercises in Composition. Continuation of Course 5b. *One hour*. Five sections. Assistant Professor FLORER and Mr. WEIGAND.

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8. Contemporary German Novels and Dramas. Continuation of Course 7.
Sec. I. Contemporary German Novels. Sudermann, Frenssen, Rosegger, Ricarda Huch, etc. Readings and discussions. *Two hours.* Assistant Professor FLOERER.
Sec. II. Contemporary German Dramas. Hauptmann, Sudermann, etc. A general reading course. *Two hours.* Assistant Professor FLOERER.
- 8b. Scientific German. Continuation of Course 7b. *Two hours.* Assistant Professor SCHOLL.
10. German Composition. Continuation of Course 9. *Two hours.* Five sections. Professor HILDNER, Assistant Professors EGERT, SCHOLL, and DIETERLE, and Dr. FEY.
- 10a. Advanced German Composition. Continuation of Course 9a. *Two hours.* Professor DIEKHOFF.
- 10b. German Conversation. Continuation of Course 9b. *Two hours.* Two sections. Dr. FEY.
- 10c. German Conversation. Advanced Course. Continuation of Course 9c. *Two hours.* Two sections. Assistant Professor DIETERLE.
Students to be eligible for this course must have taken some third-year electives in German or their equivalent.
12. Teachers' Course. Practical work and discussions on grammar, composition, and reading material now used in the high schools. Intended primarily for seniors. *Two hours.* Professor HILDNER.
14. German Syntax. Continuation of Course 13. *Two hours.* Professor DIEKHOFF.
16. Goethe's *Faust*, Part II. Continuation of Course 15. Thomas' edition. *Two hours.* Two sections. Professors WINKLER and BOUCKE.
18. History of German Literature. From Luther to Lessing. Continuation of Course 17. Lectures and selected readings. Thomas' Anthology of German Literature. *Two hours.* Two sections. Professors WINKLER and BOUCKE.
20. History of the Younger Romantic Movement and *Das junge Deutschland*. Continuation of Course 19. *Two hours.* Professor WINKLER.
- 20a. History of German Literature from 1848 to 1900. Continuation of Course 19a. Lectures, reports and discussions. *Two hours.* Professor BOUCKE.
- 23a. The Dramatic Works of Friedrich Hebbel. Lectures and reports on assigned topics. Continuation of Course 23. *Two hours.* Professor HILDNER.
- 23c. Franz Grillparzer. His Life and Works. Lectures and reports on assigned topics. Continuation of Course 23b. *Two hours.* Assistant Professor EGERT.

- 23d. Heinrich von Kleist. His Life and Works. Lectures, discussions and reports on assigned topics. *Two hours.* Assistant Professor SCHOLL.
Prerequisite: Some third-year electives or their equivalent.
- 24a. Studies in the History of the German Novel, with special emphasis upon recent German Literature. Continuation of Course 24. *Two hours.* Assistant Professor FLORER.
- 25b. Lessing's *Laokoon*. A study of Lessing's essay with comparison of the critiques of Herder and Goethe. *Two hours.* Professor HILDNER.
Prerequisite: Some electives in third-year German.
26. Teachers' Course. Lectures and discussions on methods of teaching German and organization of courses. *One hour.* Professor WINKLER.
28. Introduction to Middle High German. Lectures and recitations. Continuation of Course 27. *Two hours.* Professor DIEKHOFF.
- 28a. Middle High German Literature. A survey of German Literature from 1100-1500. Continuation of Course 27a. Primarily for graduates. *Two hours.* Professor DIEKHOFF.
30. Old High German. Readings from Otfrid's *Evangelienbuch*, and lectures on Old High German Literature. Primarily for graduates. Continuation of Course 29. *Two hours.* Assistant Professor EGGERT.
40. Seminars in the German Classics. A comprehensive study of the lives and works of Goethe and Schiller with investigations of selected topics. Primarily for graduates. Continuation of Course 39. *Two hours.*
 - a. Goethe. Professor BOUCKE.
 - b. Schiller. Professor WINKLER.

Instead of the Seminary in Schiller, a Seminary in Herder may be given in 1913-1914.

Journal Club:—

Current Literature on German Philology and Literature. Meetings of instructors and advanced students in the German Department are held every three weeks throughout the academic year, at which reports are made on important recent contributions on German Philology and Literature.

Gothic

FIRST SEMESTER

1. Lectures on Phonology and Morphology and reading of the Gospels. Wright's *Primer of the Gothic Language*. Primarily for graduates. *Two hours.* Professor DIEKHOFF.

SECOND SEMESTER

2. Epistles. Heyne's *Ulphilas*. *Two hours.* Professor DIEKHOFF.

Scandinavian

FIRST SEMESTER

- [1. History of the Scandinavian Literature in English. Lectures and selected readings from the works of Lie, Kielland, and Björnson in English translations. Introductory course treating of the most important aspects of the leading Scandinavian writers and their relation to the larger European literary movements. Professor BOUCKE. Omitted in 1913-1914.]

SECOND SEMESTER

2. Henrik Ibsen. Comprehensive Study of His Life and Works. Selected Readings from his Dramas in English Translations. Lectures and discussions. *Two hours.* Professor BOUCKE.

ENGLISH

Courses 11, 12, and 14 are conducted on the seminary plan, the class being divided into small sections for the presentation of theses and reports, and for extempore discussion and conference. These courses are designed for advanced students only, and are usually taken by students in their last year of residence at the University.

Courses 3, 7, 8, 9, 10, 10a, 11, 12, 14, 15, 16, 16a, 17, 18, 18a, 20, 21, 22, 23, 26, 27, and 28 will ordinarily be found suitable for graduate students as well as for undergraduates. In the case of students who have taken these courses for their first degree, special advanced courses are arranged for graduate study, after conference with the candidate.

Courses 1 and 2 will satisfy the requirement in English in the literary-law course and in the other combined courses.

Consultation Hours.—During the first two weeks of the first semester Professor DEMMON will be in Room 208, T. H., at 4 P. M. each day to confer with students concerning their work. Hours for the remainder of the year will be posted later.

Professor STRAUSS—The first week of each semester: every day at 4; thereafter throughout the year, every day at 11. Room 209, T. H.

Professor TATLOCK—The first week of each semester: every day at 4. Room 206, T. H.

Professor TILLEY—Throughout the year: every day at 4. Room 206, T. H.

Assistant Professor HUMPHREYS—The first week of each semester: every day at 4. Room 208, T. H.

Dr. GINGERICH—Throughout the year, W, F, at 4. Room 208, T. H.

FIRST SEMESTER

1. English Literature. Historical Outline, with assigned readings. *Three hours.* Seven sections. Professors TATLOCK and TILLEY, Assistant Professor HUMPHREYS, and Dr. GINGERICH.
This course (together with Course 2) is designed to give a general introduction to the subject, preparatory to a more minute study of special periods.
3. Anglo-Saxon. *Three years.* Professor TATLOCK.
Course 3 aims to give some understanding of the development and continuity of the English language, some acquaintance with Anglo-Saxon literature, and a reading knowledge of West-Saxon prose. This course (together with Course 8) will be found advantageous for all who wish more than an elementary acquaintance with English philology or literature.
4. English Literature. Shakespeare. A critical reading of four representative plays. Lectures on the history of the Text. *Two hours.* Two sections. Professor DEMMON.
Course 4 must be preceded by Courses 1 and 2 or an equivalent.
5. English Literature. Chaucer. *Two hours.* Professor TATLOCK.
The General Prologue and several of the Canterbury Tales are read in the class-room, with attention to language and antiquities, and with the purpose of giving an intelligent appreciation of Chaucer and his age. Most of Chaucer's poems will be read outside by the students, and occasional lectures will be given.
- 5a. English Literature. From the Renaissance to the Death of Spenser. *Three hours.* Professor TILLEY.
6. English Literature. From Milton to Pope. *Three hours.* Assistant Professor HUMPHREYS.
7. The History of the English Language. *Two hours.* Professor TILLEY.
This course will be introduced by a study of the elements of Anglo-Saxon.
10. Poetics. The Epic and the Lyric. Lectures and discussions. *One hour.* Professor DEMMON.
Course 10 is especially designed to accompany Course 11.
11. English Literature. Study of Masterpieces: Spenser's *Faery Queen*; Shakespeare's *Sonnets*; Milton's *Paradise Lost* and *Paradise Regained*; Dryden's *Satires*; Wordsworth's *Prelude* and *Excursion*; Tennyson's *Maud* and *Idylls of the King*; Browning's *The Ring and the Book*. *Two hours.* Professors DEMMON and STRAUSS.
Open to graduate students and to others who receive permission. Graduate students may elect this course as *three hours*. Each member of the class is expected (1) to present an essay upon an assigned masterpiece; (2) to read the entire list of

works with which the course deals, together with such critical literature on each subject as there may be time for; (3) to participate each week in a general extempore discussion of the work in hand.

13. English Literature. Introduction to the Poetry of Browning. *Three hours.* Professor STRAUSS.

A study of selections from the *Dramatic Lyrics*, *Dramatic Romances*, *Men and Women*, *Dramatis Personae*, and of one or two of the dramas.

- [15. English Literature. The Thirteenth and Fourteenth Centuries. *Two hours.* Professor TATLOCK.

Course 15 is open to those who take, or have taken, a course in Chaucer, and to others who receive permission. It will deal mainly with pre-Chaucerian Middle English literature, and will consist in lectures and outside reading, with the purpose of illustrating Chaucer and the Middle Ages. Mediæval literature and be classified according to its various *genres* and origins; an account will be given of twelfth century Latin literature, of the chronicles, of the origins of the Arthurian and other romantic material, of the fabliaux, legends, and the like. Omitted in 1913-1914.]

- [16. English Literature. From Chaucer to the Renaissance. *Two hours.* Professor TATLOCK.

The course in Chaucer (5) is recommended as a preparation for this course. It will consist of lectures and outside reading on Chaucer; Wyclif, Gower, Langland, the pseudo Mandeville, Malory, Skelton, the Scottish poets of the fifteenth and sixteenth centuries, and other writers, and on the native origins of the English Drama. Omitted in 1913-1914.]

- 16a. Shakespeare in Relation to other Dramatists of his day. *Two hours.* Professor TATLOCK.

Open to graduate students, and to undergraduates after consultation. Special attention will be paid to the story of the siege of Troy as treated by Shakespeare and others. Reports will be made by the students. The McMillan Shakespeare library offers unusual facilities for such studies.

17. Studies in the text of Shakespeare. *Two hours.* Professor DEMMON.

Course 17 is designed principally for graduate students. The aim will be to illustrate the methods of textual study as applied to a play like *Hamlet*, and the difficulties to be overcome in establishing a text. The McMillan Shakespeare Library affords a very full apparatus for these studies.

18. English Literature. The Development of the English Novel. *Two hours.* Professor STRAUSS.

A study of the rise of the novel in England as an art form, with an attempt to discover the principle of its development.

Lectures, discussions, and readings in the works of Lyly, Greene, Lodge, Nashe, Sidney, Bunyan, Defoe, Swift, Addison and Steele, Richardson, Fielding, Smollett, Sterne, and others.

20. The English Drama before Shakespeare. *Two hours.* Professor TILLEY.
Marlowe, Lyly, Kyd, and Greene will be studied. Especial emphasis is laid upon the influence of these writers upon Shakespeare. Open to those who have had a course in Shakespeare.
24. The English Bible, its literary aspects and influence. *Two hours.* Assistant Professor HUMPHREYS.
The King James Version will be used in class. A leading aim of this course (together with Course 25) will be to acquaint the student with the Scripture Story as material for literary allusion and illustration. The course may be taken in connection with or following Course 1.
- [26. English Literature. Ben Jonson. *Two hours.* Professor TILLEY.
The course will consist of the critical reading of three of Jonson's representative plays, together with lectures on his relation to Shakespeare and other contemporary dramatists. Omitted in 1913-1914.]
27. Studies in Modern English Literature. Primarily for graduates. *Two hours.* Professor STRAUSS.
In 1913-1914 the subjects for study will be selected from the following: The Classical Movement; Restoration Comedy; Eighteenth Century Essayists; the Rise of Romanticism; Development of the Novel; Nineteenth Century Fiction; Brown-ing's Major Works; Present Tendencies in the Drama.
30. Studies in Wordsworth. *Two hours.* Dr. GINGERICH.
A considerable portion of Wordsworth's works will be read in class. Some attention will also be paid to Wordsworth's theory of diction and its application to his own poetry. This course is especially designed for "part-time" students.

SECOND SEMESTER

2. English Literature. Historical Outline, with assigned readings. *Three hours.* Six sections. Professors TATLOCK and TILLEY, Assistant Professor HUMPHREYS, and Dr. GINGERICH.
Course 2 is a continuation of Course 1.
- 4d. English Literature. Shakespeare. *Two hours.* Two sections. Professor TILLEY.
A critical reading of *Twelfth Night*, *King Lear*, and *The Tempest*. A number of other plays are assigned as collateral reading for class discussion.

- 5b. English Literature. From the death of Spenser to the Restoration. *Three hours.* Professor TILLEY.
- 6a. English literature. From Pope to Wordsworth. *Three hours.* Assistant Professor HUMPHREYS.
- [6b. English Literature. From Wordsworth to Tennyson. *Three hours.* Professor TATLOCK.
The course will consist of lectures and outside reading, with recitations on both. It will deal with Wordsworth, Coleridge, Scott, Byron, Shelley, Keats, and other poets; and with Lamb, De Quincey, Scott, Jane Austen, and other prose writers. Omitted in 1913-1914.]
- 6c. English Literature. The Victorian Age. *Three hours.* Professor TATLOCK.
Lectures and outside reading, with recitations on both. The course will deal with Tennyson, Browning, and other poets; with Dickens, Thackeray, George Eliot, and other novelists; and with such other prose writers as Carlyle, Macaulay, Cardinal Newman, Ruskin, Walter Pater, and Matthew Arnold.
8. Anglo-Saxon Poetry. *Three hours.* Professor TATLOCK.
Beowulf and several lyric poems will be read.
9. The History of the English Language. *Two hours.* Professor TILLEY.
Course 9 is a continuation of Course 7.
- 10a. Poetics. The Drama. Lectures and discussions. *One hour.* Professor DEMMON.
Course 10a is especially designed to accompany Course 12.
- 10b. English Literature. Dramatic Technique. *Two hours.* Professor STRAUSS.
Course 10b is open only to those who receive special permission.
12. Shakespeare Seminary. Plays selected: *A Midsummer Night's Dream; The Merchant of Venice; As You Like It; The Tempest; Richard III;* the two parts of *Henry IV; Henry V; Romeo and Juliet; Hamlet; Othello; King Lear; Macbeth; Coriolanus.* *Two hours.* Professors DEMMON and STRAUSS.
Open to graduate students and to others who receive permission. The method is similar to that pursued in Course 11.
Graduate students may elect this course as *three hours.*
14. American Literature. Authors studied: Irving, Cooper, Bryant, Emerson, Hawthorne, Longfellow, Whittier, Poe, Holmes, Thoreau, Lowell, Taylor, Howells, and James. *Two hours.* Dr. GINGERICH.
Course 14 is open to graduate students and to others who receive permission. Representative works of the authors named are studied and compared with masterpieces of British authors, and an attempt is made to discover the distinctively American elements.

- 18a. English Literature. Prose fiction of the Nineteenth Century. *Two hours.* Professor STRAUSS.
Course 18a is a continuation of Course 18. Lectures, discussions, and readings in the works of Scott, Austen, Bulwer-Lytton, Disraeli, Dickens, the Brontë sisters, George Eliot, Trollope, Reade, Kingsley, Meredith, Blackmore, Hardy, Stevenson, and others. Open to students who have completed Course 18, and to others who receive permission.
19. English Literature. A study of poetic forms (Epic, Lyric, Drama) as illustrated in the works of Tennyson, Arnold, Morris, Rossetti, and Swinburne. Introduction to the study of English metres. *Three hours.* Professor DEMMON.
This course must be preceded by Courses 1 and 2 or an equivalent.
21. English Literature. Chaucer. *Two hours.* Professor TATLOCK.
The purpose of Course 21 will be to give a more intimate acquaintance with Chaucer than can be gained from Course 5. It should be preceded by Course 5, or an equivalent.
22. English Literature. Contemporary Drama. *Two hours.* Professor STRAUSS.
A brief review of the drama from Sheridan to Bulwer-Lytton will be followed by closer study of the principal Nineteenth Century dramatists, with attention to continental influences. Robertson, Gilbert, Pinero, Jones, Yeats, Phillips and others will be studied, and an attempt will be made to discover the present tendencies of the drama. The courses presuppose a knowledge of Elizabethan and Restoration drama, and is open only to those who receive special permission.
- [23. Middle English. *Two hour.* Professor TATLOCK. Omitted in 1913-1914.]
25. The English Bible, its literary aspects and influence. *Two hours.* Assistant Professor HUMPHREYS.
Course 25 is a continuation of Course 24.
28. Studies in Modern English Literature. Primarily for graduates. *Two hours.* Professor STRAUSS.
Course 28 is a continuation of Course 27.
31. Studies in Tennyson. *Two hours.* Dr. GINGERICH.
A large portion of Tennyson's poetry will be read in class. Some attention will also be paid to poetic forms as illustrated in his works. This course is especially designed for "part-time" students.

RHETORIC

Courses 1 and 2 are required of all first-year students, and must precede all other courses.

The courses offered in this department are of three principal kinds: (1) Courses intended primarily to give the student practice in the leading types of prose composition, including Courses 1, 2, 3, 4, 15, and 20. (2) Courses intended primarily to familiarize the student with the fundamental principles of Rhetoric and Criticism, including Courses 5, 7, 8, 9, 10, 12, 16, and 17. Courses 7, 8, 12, 23, and 24 combine advanced composition with the study of rhetorical and critical theory. (3) Courses for students who are preparing for newspaper work. A special circular regarding these courses may be obtained upon application to the Secretary of the University.

Courses 1 and 2 are introductory in character. They aim to promote clearness and correctness of expression through practice in the simpler kinds of composition. Courses 3 and 4, in which there is systematic practice in the four principal types of prose composition, are intended to follow Course 2, and are usually taken in the second year. Courses 5, 12, 15, 16, and 20, being still more advanced, belong naturally in the third year. In Courses 7 and 8 it is assumed that the student has already acquired considerable proficiency in composition and is prepared to give attention chiefly to the discussion of principles. In Courses 23 and 24 provision is made for those who show exceptional proficiency in writing or who aim to follow literary composition as a profession. Courses 9 and 10 are planned solely for students who are working for the higher degrees.

The advanced and graduate courses presuppose an acquaintance with the fundamental principles of rhetoric and a reasonable proficiency in the technique of prose. The study of composition, except where it is pursued with reference to the theory of teaching, is regarded as an undergraduate study.

Students in the combined Literary and Law Course should elect Courses 1, 2, 3, and 4, though Course 15 may with permission of the instructor be substituted for Course 3 or Course 4.

Consultation Hours.—Professor SCOTT may be consulted in Room 207, W. H., from 8:30 to 9 A. M. on *M*, *Tu*, *W*, and *Th*; Professor RANKIN, *M*, *W*, *F*, 12-12:30, *Tu*, 3, to 4, Room 202, W. H.; Assistant Professor BRUMM, *M*, 4 to 5, Room 203, W. H.; Mr. TOMPKINS, *F*, 4 to 5, Room 101, W. H.; Dr. MALLORY, *S*, 10 to 12, Room 103, W. H.; Mr. COWDEN, *Tu*, 4 to 5, Room 101, W. H.; Mr. WIER, *Tu*, *Th*, 11 to 12, Room 101, W. H.; Mr. SENSEMAN, *W*, 3 to 4, 4:30 to 5, Room 103, W. H.; Mr. SCOTT, *W*, 3:30 to 5, Room 201, W. H.; Mr. DOUGLAS, *M*, 3:30 to 5, Room 201, W. H.; Mr. LANE, *M*, 3:30 to 5, Room 101 W. H.; Mr. BRYSON, *W*, *F*, at 2, Room 101, W. H.

FIRST SEMESTER

1. Composition and Rhetoric. *Three hours.* Nineteen sections. Mr. TOMPKINS, Dr. MALLORY, Mr. COWDEN, Mr. WIER, Mr. SENSEMAN, Mr. SCOTT, Mr. DOUGLAS, Mr. LANE, and Mr. BRYSON.

Before electing Course 1 the student must obtain from the Committee on Elections a slip indicating the section to which he is assigned. This slip is to be handed to the instructor at the first recitation. Students who are not thus assigned to specific sections will not be admitted to the class rooms.

2. Continuation of Course 1. This course is the same as Course 2 given in the second semester. It is open only to students who have already completed Course 1, or have received credit for it. Students who need three hours to complete the requirement in Rhetoric for graduation are expected to take Course 2 in the first semester, as the sections announced for the second semester are not open to such students. *Three hours.* Mr. WIER.

3. Advanced Composition and Rhetoric. Essays in description and narrative. *Three hours.* Six sections. Professor RANKIN, and Assistant Professor BRUMM.

5. Rhetorical Analysis. *Two hours.* Professor RANKIN. Genung's *Handbook of Rhetorical Analysis* will be used as a basis for study. Special attention will be given to the minute analysis of structure.

Open to Juniors; to others, by permission only.

7. Interpretations of Literature and Art. *Two hours.* Two sections. Professor SCOTT.

The first weeks of the course are given to a discussion of critical principles. These principles are then applied in the appreciation and interpretation of specimens of literature and art. Open only to senior and graduate students who have permission. The course is conducted as a seminary.

9. Seminary in Rhetoric and Criticism. *Two hours.* Professor SCOTT.

The subjects of discussion vary from year to year. Among the problems to be investigated are the following: The origins of prose; the nature and origin of the leading types of discourse; the psychology of figures of speech; the rhythm of prose; the sociological basis of the principles of usage; the origin, development, and laws of the process of communication.

Open only to graduate students.

13. The Newspaper: its nature, function, and development. Lectures and discussions. *Two hours.* Professor SCOTT.

Intended for students who are preparing to do newspaper work. The course is conducted as a seminary and is open only to students who obtain special permission.

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15. The Theory and Practice of Argumentation. *Three hours.* Assistant Professor BRUMM.

A study of the principles which underlie argument. Special attention will be paid to the brief and to the relative value of various forms of proof. This course is intended for those who desire special training in argumentation. Open to students who have had Courses 1, 2, 3, and 4, and others who receive special permission.

- 17.. Diction and Usage. *Two hours.* Mr. TOMPKINS.

The work of this course is intended to accomplish two results: (1) the establishment of a method of dealing with problems in diction and usage; (2) the development of the student's art sense in the use of language. Under the first heading various questionable words and idioms will be discussed with a view to determining their standing as parts of the English language. Under the second heading passages from standard prose and verse will be examined with the purpose of discovering whether each word or phrase used is the one best adapted to the author's artistic purpose.

23. Seminary in Advanced Composition. *Two hours.* Professor SCOTT.

This course is intended for a limited number of advanced students who, writing with facility and being in the habit of writing, desire personal criticism and direction. No work is assigned and no set program is followed, but each student is expected in the course of the semester to submit for revision a considerable number of manuscripts. In connection with the class discussions, there will be talks upon the essentials of English Composition and the principles of criticism and revision. Open only to seniors who receive special permission.

25. Practical Newspaper Work.

This course is open only to students who are registered in the course in preparation for newspaper work. It is, in general, limited to seniors, and must not be elected without permission. The work is done in connection with one of the student or University publications. Credit, *from one to four hours, to be arranged.* Professor SCOTT.

SECOND SEMESTER

2. Composition and Rhetoric. *Three hours.*

Continuation of Course 1. The hours and instructors are the same as those announced under Course 1, the first semester. Students cannot change from one section to another at the beginning of the second semester without obtaining special permission.

1. Same as Course 1 given in the first semester. Open only to students who enter at the beginning of the second semester, or who have failed to receive credit in Course 1 in the first semester. *Three hours.* Mr. WIER.

4. Advanced Composition and Rhetoric. Essays in Exposition and Argument. *Three hours.* Four sections. Professor RANKIN and Assistant Professor BRUMM.
8. Prose Fiction. *Two hours.* Two sections. Professor SCOTT. Studies in the structure and function of the leading types of prose fiction, including the short story.
Open only to senior and graduate students who have permission. The course is conducted as a seminary.
10. Seminary in Rhetoric and Criticism. *Two hours.* Professor SCOTT.
Continuation of Course 9. Open only to graduate students.
12. Reviews. Essays, readings, and discussions. *Two hours.* Mr. TOMPKINS.
The aim of this course is to give practice, under direction, in the writing of book-reviews for newspapers and magazines. Standards of criticism and methods of reviewing will be studied, and specimen reviews will be analyzed in detail.
Open to students who receive permission.
14. Newspaper Writing.
Exercises in the various kinds of writing comprised in modern newspaper practice, such as news stories, feature stories, interviews, correspondence, and editorial articles. *Two hours.* Professor SCOTT.
A continuation of Course 13.
16. Modern English Prose. *Three hours.* Assistant Professor BRUMM.
A study of the development of English prose style as exemplified in the writings of Sidney, Lyly, Bacon, Milton, Dryden, Swift, Addison, Johnson, Lamb, Carlyle, Macaulay, Arnold, Pater, and Stevenson. Written reports and class room discussions.
20. Short Story Writing. *Two hours.* Two sections. Professor RANKIN.
Analytic studies in the technique of the short-story will be accompanied by constructive work in story writing.
Open only to juniors and seniors who have had Course 3.
24. Seminary in Advanced Composition. *Two hours.* Professor SCOTT.
Continuation of Course 23. Open only to students who receive special permission.
26. Practical Newspaper Work.
Continuation of Course 25.

ORATORY

Students who desire practice in public speaking in addition to that offered in the class room are advised to join a literary society and take part in the debates and oratorical contests provided by the Oratorical Association. For information regarding the contests of the Northern Oratorical League, the Intercollegiate Peace Asso-

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ciation, the Hamilton Club Contest, the Central Debating League, and the Lyceum Club, and the medals and testimonials offered, see CALENDAR or consult the instructors of this department.

Students who wish to acquire exceptional proficiency in public speaking should begin class work early in their college course.

Those preparing to teach Oratory should take at least eighteen hours of work in the department selected after consultation with the professor in charge. Only those who show marked ability in expressive reading and in public speaking will be encouraged to prepare for teaching.

Consultation Hours.—Professor TRUEBLOOD may be consulted in Room 404, N. W., *M, W, F*, at 9:30; Assistant Professor HOLLISTER, *Tu, Th*, at 10. Additional consultation hours will be posted on the bulletin board in Room 302, N. W.

FIRST SEMESTER

1. Elocution: Introduction to speaking and Reading. Text-book and Lecturés. *Three hours.* Six sections. Assistant Professor HOLLISTER and Mr. IMMEL.

This course consists in (1) a study of the theory of expression by voice and action, (2) exercises for developing the voice and improving the stage presence, (3) practice in reading and speaking. The course seeks to give the student the fundamental principles necessary to self criticism, and an opportunity to apply these principles in practice. Orations and narratives are studied, memorized and interpreted from the platform, with special reference to thoughtful, earnest, distinct, direct, interesting speaking.

3. Study of Great Orators. *Three hours.* Professor TRUEBLOOD. Lectures on methods of public address and sources of power. Study of representative orations. Structure of the oration. Qualities of a good oration. The preparation and delivery of speeches. Those who desire at some time to enter the oratorical contests should take this course. Orations prepared for University contests will be accepted as a part of the work. Course 3 must be preceded by Course 1 or its equivalent.
5. Debating. *Three hours.* Professor TRUEBLOOD. Study and application of the principles of argumentation. Preparation of briefs. Leading questions of the day studied and debated in class. The students take part in six debates. The aim is to develop readiness in extempore speaking, to give freedom and ease on the platform, and to cultivate the logical processes of analysis and discrimination. All who expect to enter the debating contests or who expect to teach argumentation should take this course.

Course 5 must be preceded by Course 1 or its equivalent.

- 5a. Debating. *Two hours.* Professor TRUEBLOOD.
Study of the elements of effective debating. Gathering of material, brief-making, construction of arguments and effective presentation of them from the platform are aims of this course. Each student takes part in five debates and makes short speeches from the floor in general discussions.
This course is similar in character and purpose to Course 5.
Course 5a must be preceded by Course 1, or its equivalent.
7. Shakespearean Reading. *Two hours.* Two sections. Professor TRUEBLOOD.
Critical study of two plays, a tragedy and a comedy. Analysis of character, plot and incident. Expressional reading of principal scenes. Characters assigned to members of the class and scenes presented from the platform. Public presentation of plays twice each semester. Plays selected from the following: *Julius Caesar, Othello, The Merchant of Venice, Romeo and Juliet, The Tempest.*
Course 7 must be preceded by Course 1 or its equivalent.
- [7a. Shakespearean Reading. Continuation of Course 7. *Two hours.* Two sections. Professor TRUEBLOOD.
Plays to be selected from the following: *Coriolanus, King John, Henry VIII, Anthony and Cleopatra, The Comedy of Errors, The Taming of the Shrew, Measure for Measure.*
Course 7a must be preceded by Course 1, or its equivalent.
Omitted in 1913-1914.]
9. Interpretive Reading. *Two hours.* Two sections. Assistant Professor HOLLISTER.
This course involves a study in appreciation, and oral interpretation of masterpieces of literature. Special effort is made, first, to understand and feel, second, to express for others. Selections are drawn from miscellaneous sources, are read aloud in class, and delivered from the platform. The course is designed, not only to develop good reading for purposes of culture and public entertainment, but especially for those who expect to teach English Literature.
Open to students who have had Course 1 or its equivalent.

SECOND SEMESTER

1. Elocution: Introduction to speaking and reading. Text-book and lectures. *Three hours.* Three sections. Mr. IMMEL.
This is the same as Course 1 given in the first semester.
2. Public Speaking. *Two hours.* Four sections. Assistant Professor HOLLISTER, and Mr. IMMEL.
Studies in public speaking, and the delivery of short original speeches for special occasions. Emphasis is laid on the preparation of a thorough brief for each speech. Speeches given from the platform without the use of notes. This course aims to give as much practice in self expression as possible.
Course 2 must be preceded by Course 1 or its equivalent.

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3. Study of Great Orators. *Three hours.* Professor TRUEBLOOD.
This is the same as Course 3, given the first semester.
Students who desire to enter the oratorical contests of the following year are advised to take this course.
Course 3 must be preceded by Course 1 or its equivalent.
4. Shakespearean Reading. *Two hours.* Two sections. Professor TRUEBLOOD.
Oral reading of two plays, a tragedy and a comedy. Characters assigned to members of the class and plays presented from the platform. Public presentation of plays twice each semester. The aim is to stimulate interest in Shakespeare by vocal interpretation and dramatic presentation. Plays selected from the following: *Macbeth*, *Richard III*, *Much Ado About Nothing*, *Henry IV (Part I)*, *The Winter's Tale*, *A Midsummer Night's Dream*.
Course 4 must be preceded by Course 1, or its equivalent.
- [4a. Shakespearean Reading. Continuation of Course 4. *Two hours.* Two sections. Professor TRUEBLOOD.
Plays to be selected from the following: *Hamlet*, *King Lear*, *Henry V*, *As You Like It*, *Twelfth Night*, *Cymbeline*. Omitted in 1913-1914.]
Course 4a must be preceded by Course 1, or its equivalent.
5. Debating. *Three hours.* Professor TRUEBLOOD.
This is the same as Course 5, given in the first semester.
- 5a. Debating. *Two hours.* Professor TRUEBLOOD, and Assistant Professor HOLLISTER.
This is the same as Course 5a, given in the first semester.
10. Advanced Public Speaking. *Two hours.* Professor TRUEBLOOD, and Assistant Professor HOLLISTER.
Examination of the Webster-Hayne and the Lincoln-Douglass debates. Study of famous platform addresses. Preparation and delivery by each student of an extended address. Participation in a public debating or oratorical contest during the semester, or the presentation of an equivalent amount of practical speaking before public assemblies is required.
Open to students who have shown exceptional proficiency in speaking and reading. Course 10 must be preceded by Courses 1, 2, and 3 or 5.
11. Oral Interpretation of Poetry. *Two hours.* Two sections. Assistant Professor HOLLISTER.
The oral interpretation of selections from one of the following poets: Browning, Tennyson, Longfellow, Lowell. In 1913-1914 Browning will be studied.
Designed especially for those who expect to teach English Literature.
Open to students who have had Course 1, or its equivalent.

BIBLIOGRAPHY

FIRST SEMESTER

1. Historical Bibliography, or "The Evolution of the Book," Lectures. *One hour.* Professor DAVIS.

SECOND SEMESTER

2. Practical Bibliography, or the Description, Care, and Use of Books. Lectures. *One hour.* Professor DAVIS.

MUSIC

The courses in Music are open to students who evince sufficient ability to pursue them with profit, and are subject to the general rule regarding elections. All the courses in music run through the entire year, and students are earnestly advised to take them both semesters. The instruments in the Stearns Collection, an "Aeolian Orchestrelle," a "Pianola," "Victor" records, and lantern slides are used for purposes of illustration.

In order that the students in these courses may become familiar with the most important classical and modern works, they will receive full admission to the Faculty Concerts and Historical Recitals, given under the auspices of the University School of Music.

Practical Music.—Credit, not to exceed two hours per semester, will be given for advanced work in Pianoforte. Organ, Violin Playing, and in Singing, under conditions which may be learned on application to Professor STANLEY.

Consultation Hours.—The first week of each semester, daily, at 4; for the remainder of the semester, *M, W*, at 4.

All courses in Music will be given in the Lecture Room, Memorial Hall.

FIRST SEMESTER

Technical Courses.—1, 3, 5, 7, and 17. Course 7 is intended primarily for graduates, but is open to undergraduates who receive special permission.

1. Science of Harmony. *Two hours.* Mr. MOORE.
In this course, as in the other technical courses, the student is encouraged to make a practical application of the subject through creative work of a nature conditioned by the scope of the course.
3. Simple Counterpoint. *Two hours.* Mr. MOORE.
This course includes a thorough review of Course 1, with a more extended application to creation.
5. Double Counterpoint. *Two hours.* Professor STANLEY.
7. Canon and Fugue. *Two hours.* Professor STANLEY.

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17. Advanced Practical Music. *One or two hours.*

This course may be elected only by written permission of Professor STANLEY. It may be elected a second time as 17a.

Historical and Critical Courses.—1a, 9, 11, 13, 15.

- 1a. Creative Listening. *Two hours.* Professor STANLEY.

In this course, which requires no preparatory training, students are led to an appreciation of the best music through systematic and directed listening, supplemented by the study of the best critical writers. The opportunities for hearing good music, elsewhere stated, will in this manner become increasingly stimulating and valuable.

9. History of Music. From the Christian Era to the Beethoven Period. *Three hours.* Professor STANLEY.

13. Evolution of Musical Instruments. *One hour.* Professor STANLEY.

15. Seminary. The Romantic School. *Two hours.* Professor STANLEY.

The subjects covered each year being different in nature and scope, this course may be reelected with Professor STANLEY's consent.

SECOND SEMESTER

Technical Courses.

2. Science of Harmony. *Two hours.* Mr. MOORE.

4. Simple Counterpoint. *Two hours.* Mr. MOORE.

6. Double Counterpoint. *Two hours.* Professor STANLEY.

8. Canon and Fugue. *Two hours.* Professor STANLEY.

18. Advanced Practical Music. *One or two hours.*

This course may be elected only by written permission of Professor STANLEY. It may be elected a second time as 18a.

Historical and Critical Courses.

- 2a. Creative Listening. A continuation of Course 1a. *Two hours.* Professor STANLEY.

10. History of Music. From the Beethoven period to the Ultra-Moderns. *Three hours.* Professor STANLEY.

14. Evolution of Musical Instruments. *One hour.* Professor STANLEY.

16. Seminary. The Ultra-Modern School. Continuation of Course 15. *Two hours.* Professor STANLEY.

The subjects covered each year being different in nature and scope, this course may be reelected with Professor STANLEY's consent.

FINE ARTS

The aim of the courses offered in this department is to give the student a knowledge of the origin and development of the Fine Arts throughout the ages. Together with the history of their growth, are studied their principles, technique, appreciation, and criticism,

and the relation of the art of the various peoples to their history, religion, literature, and daily life.

A general knowledge of history is presumed, and a knowledge of Latin and Greek is very desirable. Ability to read French and Italian will be of great assistance, though not necessary.

It is strongly urged that the courses be elected in their numerical sequence. Course 1 is offered each semester and it is prerequisite for all the others. None of these courses are open to freshmen.

Consultation Hours.—Professor HERBERT R. CROSS will meet students for consultation at his office in Memorial Hall *M, W, F*, from 9:30 to 10 and at 3.

FIRST SEMESTER

1. General Introductory Course in the Fine Arts. An investigation of the origin, development, and essential principles and technique of Architecture, Sculpture, and Painting, including a brief survey of their history from prehistoric times to the present. Text-book, S. Reinach's *Apollo*. Illustrated lectures, required reading, and written tests. *Three hours*. Professor CROSS.

This course (or its equivalent, satisfactory to the instructor) is a prerequisite for all other courses in this department.

3. Greek Art. This history of the Fine Arts among the Greeks, to the Roman period, with a preliminary survey of Egyptian and Mesopotamian art. Special attention is given to the great sculptors of the fifth and four centuries, B. C. Illustrated lectures, required reading, written tests, and reports on assigned topics. *Three hours*. Professor CROSS.
5. Renaissance Art. The history of the Fine Arts in the fifteenth and sixteenth centuries, with special attention to the development of Italian painting. Illustrated lectures, required reading, written tests, and reports on assigned topics. *Three hours*. Professor CROSS.

SECOND SEMESTER

1. General Introductory Course. A repetition of Course 1 of the first semester. *Three hours*. Professor CROSS.
4. Roman and Medieval Art. The history of the Fine Arts in the Roman, Early Christian, Byzantine, and Medieval periods, with special attention to Roman and Gothic architecture. Illustrated lectures, required reading, written tests, and reports on assigned topics. *Three hours*. Professor CROSS.
6. Late Renaissance and Modern Art. The history of Art in the seventeenth, eighteenth, and nineteenth centuries, with special reference to the French, English, and American schools of painting. Illustrated lectures, required reading, written tests, and reports on assigned topics. *Three hours*. Professor CROSS.

HISTORY

Students entering upon historical work are, as a rule, required to take first either Courses 1 and 2, dealing with the history of Europe since the seventeenth century, or Courses 1*a* and 2*a*, dealing with the history of England. The order advised is 1 before 2, or 1*a* before 2*a*, but those who find it necessary to begin their work in history the second semester may take 2 before 1, or 2*a* before 1*a*. Students who intend to take advanced work in history should elect these introductory courses (either 1 and 2, or 1*a* and 2*a*) as early as possible after entering college, preferably in the first year.

Juniors and seniors may elect these introductory courses only by special permission.

As soon as the introductory work is completed, students may elect courses in one or more of the following fields: American history (13, 14, 15, 37); ancient history (7, 8); English history (3, 4, 5, 6); mediæval and early modern European history (9, 10); modern European history (11, 12). These courses lead on to more advanced work in each field, and students are advised to consult with those in charge of such work concerning choice of courses.

Students preparing to teach history in the schools and desiring recommendation from the department of history, should take, in addition to the introductory work, at least seventeen hours. Among the courses taken should be not less than two of the two-hour courses (either Studies or Seminary work), and Course 50.

Consultation Hours.—The instructors in the department will have consultation hours as follows:

Professor VAN TYNE, absent during the year 1913-1914.

Professor DOW, the first week of the year, daily at 11, Room 202, T. H.; the rest of the year, *Tu, Th*, at 11. Room 203, T. H.

Professor PHILLIPS, the first week of each semester, daily at 11; the rest of the year *W*, at 12. Room 203, T. H.

Professor CROSS, the first two weeks of each semester, daily at 12; the rest of the semester, *M, W, F*, at 12, Room 204, T. H.

Professor TURNER, the first week of each semester, daily at 11; the rest of the semester, to be announced, Room 201, T. H.

Assistant Professor FRAYER, the first week of the year, daily at 4; the rest of the year, *M*, and *W*, at 4, Room 202, T. H.

Mr. BOUCHER, the first week of each semester, daily at 11; the rest of the semester, *Th*, 12. Room 204, T. H.

FIRST SEMESTER

Primarily for Undergraduates.

1. The General History of Europe, from the seventeenth century to 1815. Lectures and quiz sections. *Four hours.* Assistant Professor FRAYER, Mr. SCOTT, Mr. McLEAN, and reading assistants.

This course and Course 2 deal with Europe since the Thirty Years' War. The rise of Prussia and of Russia, the decline of

Spain, the ascendancy of France, the great Revolution and the Napoleonic empire are the chief subjects for study during the first semester; the growth of nationalities in the nineteenth century, and present conditions, during the second semester. Courses 1 and 2 are not open to those who have taken Courses 1a and 2a. Such students, if they wish to elect European history, should elect Courses 9 and 10.

- 1a. The General History of England, to the accession of Henry VII. Lectures and quiz sections. *Four hours.* Professor TURNER, Dr. GARRETT, and reading assistants.

This course and Course 2a are designed to give some idea of the character and culture of the people of England, and of the development of institutions which were afterwards brought to America. Narrative and military history will not be neglected, but emphasis will be put upon social and economic matters and the development of the constitution.

Courses 1a and 2a are not open to students who have taken Courses 1 and 2. Such students, if they wish to elect English history, should take Courses 3 and 4.

For Undergraduates and Graduates.

3. The Constitutional and Legal History of England, to Magna Charta. Lectures, discussion on lectures and assigned reading. *Three hours.* Professor CROSS.

The aim of this course is to explain the formation of the English constitution and to trace the origin and development of English institutions, political and legal. It should be of particular interest to those who intend to study law. It is open to sophomores who have had an introductory course, and, by special permission, to juniors and seniors who have not.

5. The History of England from the Revolution of 1688 to the Napoleonic Wars. Discussion on lectures and assigned reading. *Three hours.* Professor CROSS.

This course may be taken as a continuation of History 1a and 2a, but is open to students who have had History 1 and 2.

7. The History of Greece, to the Roman Conquest. Lectures, discussions, and collateral reading. *Three hours.* Dr. GARRETT.

9. Europe in the Middle Ages. Lectures, reading, and discussions. *Three hours.* Professor DOW.

This course treats the principal changes in Europe from the time of Rome and the rise of the Christian church to the medieval renaissance of the twelfth and thirteenth centuries. Special attention is given to institutions and ways of life and thought characteristic of the middle ages.

The course is open to all above the sophomore year, and to sophomores who have had a year of history in college.

11. The Rise of Prussia as a Factor in European History in the Seventeenth and Eighteenth Centuries. Lectures, reading and quiz. *Three hours.* Assistant Professor FRAYER.

Although the history of Prussia will be strongly emphasized, the general development of modern Germany will be treated; and a comparative study will be made of the influence exerted by the Enlightened Despotism of the eighteenth century.

14. The Political and Constitutional History of the United States. Lectures and discussions. *Three hours.* Mr. BOUCHER.

This course, supplemented by Course 15 in the second semester, covers the history of the United States from the outbreak of the Revolution to the Civil War. Special attention is given in this semester to the divergent English and American political theories, the schemes for financing the Revolutionary War, the European diplomatic entanglements, the relations of the Continental Congress and the states, the efforts to solve the problem of imperial organization, the Constitutional Convention, and the Federalist organization of the new government.

This course should be taken in the sophomore year by those who propose to make a special study of American History.

37. The History of the United States in the Civil War and Reconstruction. Lectures, reading, and quizzes. *Three hours.* Professor PHILLIPS.

This course treats of the causes and process of secession; the problems and conduct of the war; and the theories and readjustments in industry, society and government which followed the collapse of the Southern Confederacy.

Primarily for Graduates.

- [17. Seminary in American Revolutionary History. *Two hours.* Professor VAN TYNE.

Open only to graduates and to seniors obtaining special permission. This course is intended to offer training in the investigation of historical problems and practice in the handling of original material. The work in 1912-1913 was concerned with a series of historical problems in the early stages of the American Revolution, chosen for the purpose of illustrating various methods of research. Omitted in 1913-1914.]

- 19a. Studies in Medieval History. Lectures, reports and discussions. *Two hours.* Professor Dow.

This course treats subjects selected from the general field of medieval history, but chiefly from the twelfth and thirteenth centuries—the period of the “medieval renaissance.” In addition to what may be done in the lectures, each student pursues some subject individually and reports upon it in class. The course is open to graduates and seniors who have general preparation in the middle ages and in some cases to juniors. Those planning to elect it should consult the instructor.

- [19b. Studies in the Age of the Renaissance. Lectures, reports, and discussions. *Two hours.* Professor Dow.

This course treats selected subjects relating to Europe beyond Italy, especially France, the Netherlands and Spain. In ad-

dition to what may be done in the lectures, each student pursues some subject individually and reports upon it in class. The course is open to graduates and seniors who have general preparation in the middle ages and in some cases to juniors. Those planning to elect it should consult the instructor. Omitted in 1913-1914.]

23. Seminary in English History. *Two hours.* Professor CROSS.
Open only to graduates, and to seniors with the permission of the instructor. This course is devoted to the investigation of topics mainly in the sixteenth and seventeenth centuries. The work for 1913-1914 will be concerned with the period of the Puritan Revolution.
25. Introduction to Historical Method. *Two hours.* Professor DOW.
This course aims partly to give a general introduction to the advanced study of history, and partly to provide a beginning toward equipment for research in the medieval and early modern fields. It treats of the materials for investigative study in history and of the chief ways and means of utilizing them, and comprises practical exercises in criticism and interpretation, the sources employed relating to medieval and early modern times.
The course is open to any sufficiently advanced student in history, in whatever field he may be specially interested. Those planning to elect it should consult the instructor.
- 26a. Seminary in Medieval and Early Modern European History. *Two hours.* Professor DOW.
Open, as a rule, only to graduates. The members of the seminary coöperate with the instructor in the study of some subject from the sources, and may work individually on other subjects.
38. The History of the South, Colonial and Ante-Bellum. Lectures, reading and quizzes. *Three hours.* Professor PHILLIPS.
An economic, social, and political study. The plantation system, with its dependence upon staple crops, unfree labor, free trade, and local autonomy, is taken as a key to the development and policy of the South. The first semester's work, extending to 1820, deals chiefly with the régime within the South.
41. Seminary in American History. *Two hours.* Professor PHILLIPS.
Intensive research by students upon assigned topics, and discussion of the reports presented. Open only to graduates and to seniors obtaining permission of the instructor. The field for study in 1913-1914 will be American negro slavery as a working régime and as an issue in public discussion. The period principally studied will be from the American Revolution to the rise of the Garrisonian agitation.

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47. Seminary in Modern European History. *Two hours.* Professor TURNER.

This seminary will deal with some of the more striking of the social and diplomatic problems of contemporary European history, such as socialism, syndicalism, and the women's movement, and the development of the *Triple Entente* opposed to the Triple Alliance, with the alterations resulting from the Russo-Japanese war and the Turco-Balkan conflict.

SECOND SEMESTER

Primarily for Undergraduates.

2. The General History of Europe since 1815. *Four hours.* Assistant Professor FRAYER, Mr. SCOTT, Mr. MCLEAN, and reading assistants.

This course forms a continuation of Course 1. The class will be organized in the same way as in the first semester, with lectures and quiz sections, as in Course 1.

- 2a. The General History of England, since the accession of Henry VII. *Four hours.* Professor TURNER, Dr. GARRETT, and reading assistants.

This course forms a continuation of Course 1a. The class will be organized in the same way as in the first semester, with lectures and quiz sections, as in Course 1a.

For Undergraduates and Graduates.

4. The Constitutional and Legal History of England since Magna Charta. Lectures and discussions. *Three hours.* Professor CROSS.

This course is a continuation of History 3.

6. The History of England from the Napoleonic Wars to the Present Time. Lectures and discussions. *Three hours.* Professor CROSS.

8. The History of Rome, to the founding of the Roman Empire. Lectures, discussions, and collateral reading. *Three hours.* Dr. GARRETT.

This course is not devoted exclusively to constitutional and legal growth, but aims to present the various aspects of the development of the Roman state.

10. The Age of the Renaissance and Reformation. Lectures, reading and discussion. *Three hours.* Professor DOW.

This course treats the various great changes in Europe in the later middle ages and sixteenth century. Attention is given especially to the founding of modern states, economic and social reconstruction, the Renaissance, and the Reformation.

The course is open to all above the sophomore year, and to sophomores who have had a year of history in college.

12. The History of National Unity in the Nineteenth Century, with particular reference to Germany and Italy. Lectures and discussions. *Three hours.* Assistant Professor FRAYER.

13. The History of Colonial America. Lectures, with assigned readings and quizzes. *Three hours.* Professor PHILLIPS.
Treating the general theme of the expansion of Europe into the two Americas, this course deals with the conditions and purposes of the colonizing nations; the problems of life and administration in the settlements; the process of conquering the wilderness and building commonwealths; the rivalry of empires and the friction between colonies and imperial governments. Lectures, with assigned reading and quizzes.
15. The Political and Constitutional History of the United States. Lectures and discussions. *Three hours.* Mr. BOUCHER.
Course 15 is a continuation of Course 14, and deals with the reform movements of the Jeffersonian democracy, the development of national feeling, the westward movement and the rise of the political power of the West, the Jacksonian type of democracy, slavery and abolition, party entanglement in the slavery issues, and the final clash of the northern and southern social systems upon the frontier border beyond the Mississippi.
50. The Study of History in the Schools. *One hour.* Professor Dow.
This course treats, largely in a practical way, the chief problems which students of history will meet with as teachers of history. It is open, as a rule, to all who have had or are taking one of the two-hour courses in history; and is required of those who desire recommendation from the department of history, for teaching in the schools.

Primarily for Graduates.

- [18. Seminary in American Revolutionary History. *Two hours.* Professor VAN TYNE.
Limited to graduate students and to seniors obtaining permission. Course 18 is a continuation of Course 17. Omitted in 1913-1914.]
- 20a. Studies in Italian History. Lectures, reports, and discussions. *Two hours.* Professor Dow.
This course treats selected subjects in Italian history, relating chiefly to the age of the Renaissance. In addition to what may be done in the lectures, each student pursues some subject individually and reports upon it in class.
The course is open to graduates and seniors who have general preparation in the middle ages, and in some cases to juniors. Those planning to elect it should consult the instructor.
- [20b. Studies in the History of the Reformation. Lectures, reports, and discussions. *Two hours.* Professor Dow.
This course treats selected subjects relating to the origins, progress, and outcome of the Reformation. In addition to what may be done in the lectures, each student pursues some subject individually and reports upon it in class.

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The course is open to graduates and seniors who have general preparation in the middle ages, and in some cases to juniors. Those planning to elect it should consult the instructor. Omitted in 1913-1914.]

24. Seminary in English History. *Two hours.* Professor CROSS. This course is a continuation of History 23. It is open only to graduate students and to seniors obtaining permission.
- 26*b*. Seminary in Medieval and Early Modern European History. *Two hours.* Professor DOW. Open as a rule only to graduates. The members of the seminary coöperate with the instructor in the study of some subject from the sources, and may work individually on other subjects.
39. The History of the South, Colonial and Ante-Bellum. Lectures, reading and quizzes. *Three hours.* Professor PHILLIPS. An economic, social and political study. The plantation system, with its dependence upon staple crops, unfree labor, free trade and local autonomy, is taken as a key to the development and policy of the South. The second semester's work relates chiefly to the issues of state rights and slavery in federal politics.
42. Seminary in American History. *Two hours.* Professor PHILLIPS. Course 42 is a continuation of Course 41.
48. Seminary in Modern European History. *Two hours.* Professor TURNER. Course 48 is a continuation of Course 47.

POLITICAL SCIENCE

Political Science 1 and 2 are prerequisites for all other Political Science courses.

Consultation Hours.—Professor REEVES, daily except Friday and Saturday, at 10. Room 204, Ec.

Assistant Professor CRANE, *M, W*, at 4. Room 107, Ec.

Mr. HAYDEN, *M, W*, at 3.

FIRST SEMESTER

1. American Government. Lectures, readings, recitations, and reports. *Three hours.* Professor REEVES and Mr. HAYDEN. This is a course designed primarily for undergraduates as a preparation for citizenship. It is conducted by means of lectures and recitations with supplementary readings extending throughout the year. It is expected that all students electing other courses in Political Science shall have had this course or its equivalent. The work begins with a preliminary consideration of the elements of Political Science largely from the historical point of view, and passes to a study of National Government and Administration. In the second semester the

work is divided between the study of State Governments and Administration and that of the American Party System. Throughout the course attention is centered rather upon the actual workings of government than upon the more mechanical side of administration.

3. Municipal Government. Lectures, recitations, and reports. *Three hours.* Assistant Professor CRANE.

This course, while historical and comparative, gives special attention to the government of American cities of the present time. Recent tendencies and changes in municipal life and government are examined. Among the topics treated are: municipal charters, state legislative and administrative control, home rule, public service franchises, and government by commission. To each student is assigned for special investigation and report the government and administration of some smaller American city.

5. Public International Law. Lectures, recitations, and class-room discussions. *Three hours.* Professor REEVES.

The work in International Law is conducted principally by means of class-room discussion. After a general view of the elementary principles of the subject, international incidents are assigned for investigation and report. The intention is not so much to give drill in dogmatic statements of the law as to train in the independent analysis of international situations.

7. British Government and Administration. Lectures, readings, and recitations. *Three hours.* Mr. HAYDEN.

While a portion of this course is devoted to a study of English local government, its main interest is in the field of British central government and Imperial administration. As present conditions are those mainly treated, the historical development of British governmental institutions is only incidentally touched upon. For this reason students are recommended to have preparation in English history.

11. Local Government. Lectures, readings, and recitations. *Three hours.* Assistant Professor CRANE.

This course includes a historical and comparative study of local government with particular reference to the special problems of local government, exclusive of the municipality, such as: the administrative relation of the county and the state; centralization of legislative and administrative control; simplification of the frame of government; local finance and accounting.

13. Seminary in Political Science. *Two hours.* Professor REEVES.

The work of the seminary in political science for the first semester will be on the subject of the technique of legislation. An examination of the historical development of legislative forms and procedure will be made, followed by experimental work in the drafting of bills.

17. Seminary in Municipal Administration. *Two hours.* Assistant Professor CRANE.
The work of the seminary in municipal administration will be the investigation of municipal problems through research and report.
15. Journal Club of Political Science. *No credit.* Professor REEVES.
A meeting of the graduate and advanced students will be held weekly for discussion of recent literature in political science and international law.

SECOND SEMESTER

2. American Government. *Three hours.* Professor REEVES and Mr. HAYDEN.
It is expected that those who have successfully pursued Course 1 will follow with Course 2.
4. Municipal Government. *Three hours.* Assistant Professor CRANE. A continuation of Course 3.
The work of the second semester will be devoted to a discussion of concrete municipal problems, such as the relation of the municipality to quasi-public works; to the food supply, health and other social problems.
6. Public International Law. *Three hours.* Professor REEVES.
This course is a continuation of Course 5.
The work of the second semester is devoted to a consideration of the leading cases in international law, English and American.
- [6a. History of American Diplomacy. Lectures, readings, and reports. *Three hours.* Professor REEVES.
This course is a continuation of the course in Public International Law. The work is divided into two parts: 1, lectures and recitations upon topics in American Diplomacy; and 2, individual investigations and reports upon more detailed subjects, principally in connection with American commerce and international arbitration. The principal topics considered in the lectures include the development of the doctrine of neutrality, the status of private property at sea during war, visitation and search, the fisheries, territorial acquisitions, and the relations with Latin America and the Far East. It is recommended that American political history be taken before electing this course. Not given in 1913-1914.]
8. Comparative European Government. Lectures, readings, and recitations. *Three hours.* Assistant Professor CRANE.
In this course attention is directed mainly to the governments and administrative systems of France, Italy, Switzerland, and the German Empire. Continental party systems and methods are studied in connection with the main subject of the course.

10. Constitutional Law. Lectures, discussions, and recitations. *Three hours.* Professor REEVES.
This course is designed for those students of American History and Political Science who do not expect to pursue the professional study of law. While a portion of the work is done by means of lectures, most of it consists of class-room analysis and discussion of the leading cases. Familiarity with American political history, as represented by college or university work in this subject, is expected of all who elect this course.
12. Colonial Administration. *Three hours.* Mr. HAYDEN.
This course is both historical and comparative, and includes an examination of the great historical colonial systems, with special reference to the administrative problems connected with the American dependencies.
14. Seminary in Political Science. *Two hours.* Professor REEVES.
During the second semester the subject to be considered will be the development of the form and structure of treaties, with especial reference to their legal and juristic content.
18. Seminary in Municipal Administration. *Two hours.* Assistant Professor CRANE. A continuation of Course 17.
16. Journal Club in Political Science. *No credit.* Professor REEVES.
Continuation of Course 15.

POLITICAL ECONOMY, SOCIOLOGY, AND BUSINESS ADMINISTRATION

Political Economy. — The instruction in Political Economy is arranged to meet the needs of three classes of students. The first class comprises those whose principal work lies in other departments of instruction, but who desire a cursory introduction to the science. Students of this class are advised to take Courses 1 and 2 unless their time is very limited, in which case they may take Course 1a or 1E. The second class comprises those who desire to make a fairly thorough study of economics, but who have not time to take the advanced or the semi-professional work offered. Such students are advised to follow Courses 1 and 2 with one or more of the following: 3, 4, 9, 14, and 15. The third class embraces those students who desire to make a thorough study of the science of economics, and especially those who wish to combine the study of political economy and finance with history, political science, and law for the purpose of preparing themselves for some one of the several professions or careers to which this group of studies naturally leads. Such persons will have no difficulty enlarging their program from the advanced electives.

It is very desirable that students specializing in economics should have a good reading knowledge of German and French. For second year work in those languages, therefore, such students should elect

courses devoted to reading rather than to conversation and composition, and, in the case of German, these courses should be the ones specially arranged for students of history and the political sciences, viz., 3a and 4a. Course 7a in the third year is also recommended.

Sociology.—Work in Sociology should begin, as a rule, with Course 19, followed by Course 22. The latter, however, may be taken first by those who find it more convenient to do so. Neither course can be taken before the junior year.

The Detroit Bureau of Associated Charities and social settlement affords special facilities to students, especially graduates, who may wish to carry on such studies as are practicable only in a large city.

Business Administration.—Special courses, on the completion of which the student will receive a special certificate in addition to his diploma, have been arranged to meet the needs of those students who wish to prepare themselves for a general business career or for particular lines of business, such as railway administration, insurance, accounting, and banking. These courses, which include a considerable amount of work in the Law Department and in the Engineering Department, are printed in detail in a special announcement. Students who desire to enroll in one of these courses should consult with Professor FRIDAY, the secretary of the committee in charge of this work, at the beginning of their university residence or as soon as possible thereafter.

Consultation Hours.—The instructors in the department will have consultation hours as follows:

Professor ADAMS, absent on leave, 1913-1914.

Professor TAYLOR, daily during the first two weeks of the semester, at 8:45, 12, and 1:30; after the first two weeks, daily at 11. Room 206, Ec.

Professor COOLEY, *M, W*, at 11, both semesters. Room 204, Ec.

Professor JONES, first week of each semester, daily from 10 to 11; for the rest of the semester, *M, W, F*, 10 to 11. Room 107, Ec.

Professor FRIDAY, from 10 to 11, *M, W, F*. Room 201, Ec.

Professor SHARFMAN, *Tu, Th*, 10 to 12. Room 209, Ec.

Professor CARLTON, *Tu, Th*, at 4. Room 105, Ec.

FIRST SEMESTER

Political Economy

1. Elements of Political Economy, I. Principles. Lectures and quiz sections. *Five hours*. Professor TAYLOR, Assistant Professor HAMILTON, Assistant Professor DOWRIE, Mr. S. M. HAMILTON, Mr. HAYES, and Mr. ROTTSCHAEFER.

This course should precede all other courses in Political Economy, except 1a, or 1E.

The course will be repeated in the second semester, and it is hoped that a considerable number of persons will elect the course for that semester rather than for the first.

- 1a. General Economics. *Three hours.* Assistant Professor HAMILTON.

This course attempts to present a general view of contemporary industrial society and to introduce the student to economic and social problems which are of current importance. While economic theory is not neglected, the stress of the course falls upon practical problems such as immigration, crises, trusts, and the control of industry. The questions discussed are treated in their larger social aspects and relationships rather than as purely industrial problems.

This course is designed primarily for those who have time but for one course in economics. Except by special permission it is open only to seniors and graduates. No student can receive credit for this course and Course 1 or Course 1E.

- 1E. Elements of Economics. Engineers' Course. Lectures and quizzes. *Three hours.* Assistant Professor HAMILTON and Mr. S. M. HAMILTON.

This course is especially designed to meet the needs of students whose work lies in professional departments, particularly engineering. Some attention will be given to the principles of economics, but the stress of the course will fall upon economic problems of current importance such as the transportation problem, the trusts, trade unionism, industrial efficiency, the social control of industry, etc. No student can receive credit for this course and Course 1 or Course 1a.

3. Social and Industrial Reforms. Lectures, quizzes, and assigned readings. *Three hours.* Professor CARLTON.

This course will be introduced by a descriptive classification of social and industrial reforms. Special attention will be given to socialism and to labor organization as elements in modern industrial evolution. The purpose of this course is to make clear current industrial tendencies and to provide the student with the material and the outlook necessary for scholarly judgment respecting them.

4. Principles of Finance. *Three hours.* Mr. HAYES.

This course treats of public expenditure and public revenue. While some attention will be given to the growth and objects of public expenditure, the stress of the course will fall on the problems and principles of taxation. Particular attention will be given to proposals for tax reforms.

7. Essentials of Economic Theory. *Two hours.* Professor TAYLOR.

This course is intended to meet the needs of persons who wish to make a fuller study of the leading problems of economic theory than was feasible in Course 1. It should be taken by all students who expect to teach economic subjects. It will be required for admission to Courses 10, 11, 11a, 11b, etc.

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8. History of Economic Thought. *Two hours.* Professor FRIDAY. In 1913-1914 special attention will be given to the period 1776-1848, and to Socialism.

9. Money: Theory and History. *Three hours.* Assistant Professor DOWRIE.

A study, first, of the nature and functions of money and credit instruments; second, of the historical development of the mechanism of exchange. Special attention will be given to the monetary history of the United States.

- 11b. Studies in Economic Theory. *Two hours.* Two sections, one for instructors. Professor TAYLOR.

Each student is required to write a thesis, which must be based in part on personal observation.

This course is given in a three-year cycle, appearing as 11, 11b, and 11d in the first semester, and as 11a, 11c, and 11e in the second semester. This year it will be elected as 11b and 11c. The work consists of special studies in the leading problems of economic theory, such as the nature and origin of value, the laws of normal value, the origin of interest, the principles regulating distribution, and so on. Designed for graduate students; open to others only by special permission.

15. Corporation Problems. Lectures, reading, discussion, and written reports on assigned topics. *Three hours.* Professor SHARFMAN.

This course undertakes a study of corporations as an element in industrial society, laying special emphasis upon the so-called trust problem and questions of government regulation of industry. It deals with the nature and history of corporations, and their significance in modern life. It offers, also, an account of the promotion, capitalization, and reorganization of corporations; but questions of finance are for the most part subordinated to a consideration of such economic aspects of industrial combination as its effects upon efficiency, wages, profits, prices, etc.

The principles of corporation finance are treated in detail in Course 37.

This course will include the field heretofore covered in Course 10 as Government Control of Industry.

17. Research Work in Economics and Finance.

This course is designed for students who desire to pursue independent research in connection with topics not covered in any other seminary. Supervision over this work will be assigned to that instructor in the department who is most interested in the subject chosen. This course may be elected only with the approval of the head of the department. The credit allowed will depend on the amount and character of the work done.

Sociology

19. Principles of Sociology. Lectures, quiz, and thesis. *Four hours.* Ten quiz sections. Professor COOLEY, Mr. THOMPSON, and assistant.

By special permission, students may elect this course as 19a, *three hours*, without the quiz.

This course aims at a systematic study of the underlying principles of social science. The general plan followed is to begin with personal relations in their simplest and most direct form; proceeding thence to the more complex form of association and to a study of social tendency and the theory of progress. Historical references are freely used, but the main purpose is a rational interpretation of existing society, and ample contemporary illustration is given of the principles advanced. While some attention is paid to the differing views of prominent writers, the course, in the main, is constructive, rather than critical. Cooley's *Human Nature and the Social Order* and *Social Organization* are used as collateral reading.

Each student is required to write a thesis, which must be based in part on personal observation.

21. Seminary in Principles of Social Work. *Two hours.* Professor COOLEY.

This course is intended for those who mean to follow some phase of social work as a profession. Each student is assigned a special line of study on which he makes a series of reports. Special permission must be obtained before electing the course. Graduate students may be assigned additional work and receive *three hours'* credit.

23. Social Development of the Church. For advanced students. *One hour.* Professor COOLEY.

This course is designed to give students intending to enter the ministry, or others specially interested in the church, an opportunity for study and discussion of the relation of the church to the rest of society, both in the past and the present time. Special permission should be obtained before electing it. It must be preceded by Course 19, and is conducted somewhat as a seminary.

25. Seminary in Social Process. Advanced study of sociological theory. Intended especially for candidates for the doctor's degree. *Two hours.* Professor COOLEY.

Business Administration

29. Principles of Industry. *Three hours.* Professor JONES.

This course is devoted to the subject of the production of wealth. In the first part of the semester an endeavor is made to determine the conditions of efficiency for each group of industries, through the statement of the chief scientific principles and technical rules applying to them.

The second part of the course is devoted to the union of industries into large groups. Beginning with the analysis of markets, cities, and regions, the approach is made to the study of national economies. These latter are presented by means of a few types; the economic differences between England, Germany, and the United States being examined, and the salient elements of the problems of the Orient, Levant, and the tropics determined.

31. Problems of Production. *Three hours.* Professor JONES.

This class of American present-day economic problems having to do with the production of wealth is here considered. Among them are the conservation of resources, mass production, industrial education, public health, high prices, the tariff, and foreign trade.

34. The Domestic Market. *Two hours.* Professor JONES.

In this course the American system of distributing and marketing products will be presented. Attention will be given to the institutions governing the trade in farm products, to manufacturer's distributive campaigns, and to wholesale and retail trade.

36. Railway Operation. *Three hours.* Lectures, readings, and reports. Mr. LANGMAID.

Students who elect this course will be expected to elect 36a in the second semester. It is designed for students who have a professional interest in Railway Operation and Administration and who desire to gain some knowledge and statistics as applied to railway construction, maintenance, operation, and valuation. It must be preceded by Courses 1, 2, 6, 38, and 38a. Students electing this course will be required to attend all special lectures bearing on railway transportation.

- [37. Corporation Finance. Lectures, reading, discussion, and written reports on assigned topics. *Two hours.* Professor SHARFMAN.

This course aims to study the organization and intercorporate relations of modern railway and industrial enterprises, with special reference to problems of finance. It deals with such subjects as the nature and varieties of stocks and bonds, movements of securities, promotion, capitalization, reorganizations, valuation, regulation of security issues, interpretation of financial reports, etc.

This course is supplementary to Course 15 on Corporation Problems and to Course 6 on Transportation Problems. Omitted in 1913-1914.]

38. Principles of Accounting. Lectures, recitations, and laboratory. *Four hours.* Professor FRIDAY, Mr. STEVENSON, and Mr. SHUGRUE.

- [39. Seminary in Transportation. *Two hours.*
This course is designed for students who have had 36 and 36a, and will be adjusted to the needs of those who elect it. For the current year Railway Associations will be studied Omitted in 1913-1914.]
40. Advanced Accounting Practice and Auditing. *Three hours.*
Professor FRIDAY and Mr. SHUGRUE.
45. Introduction to Law. Lectures, reading and discussion of selected cases. *Three hours.* Professor SHARFMAN.
This course aims to provide for students of economics and business administration a general understanding of the nature, sources, and purposes of law, and its relation to other human interests, with special reference to man's industrial and commercial activities.
The course continues through the entire year, and students who elect Course 45 in the first semester will be expected to elect Course 45a in the second semester.
During the first semester emphasis will be placed chiefly upon the character and development of law and our legal system as a whole, specific applications of legal principles being introduced as illustrative material. The reading will be of a general nature, consisting of selections from authoritative writings in the field of law, economics, and political science.
During the second semester a study will be made of the underlying principles of commercial law as they appear in the law of contracts and of sales, and in the law of business association, involving the important principles of agency, partnership, and corporations. During the second semester the work will consist chiefly of class-room discussion of selected cases.
49. Mathematical Theory of Statistics (I). *Two hours.* Elect as Mathematics 49. Professor GLOVER.
The subjects treated in this course are averages, graphical representation of statistics, frequency curves, correlation, smoothing of statistics; with applications to statistical problems in economics, biology, insurance, and physics.
A knowledge of calculus is necessary.
51. Introduction to the Mathematical Theory of Interest, Insurance, and Statistics (I). *Two hours.* Elect as Mathematics 51. Professor GLOVER.
The aim of this course is to explain and illustrate the application of mathematics to financial transactions, life insurance, and statistics, to such an extent as may be of interest and value to the general student.
It must be preceded by Mathematics 1 (or 1E) and 2 (or 2E).
The attention of students who desire to specialize in insurance or actuarial mathematics is called to a note, concerning the arrangement of their work, in this Announcement under Mathematics.

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53. Advanced Mathematical Theory of Interest and Life Contingencies (I). Elect as Mathematics 53. Professor GLOVER.
For further information see Course 53 in Mathematics.
55. Seminary in Actuarial and Statistical Mathematics. *Credit to be arranged.* Elect as Mathematics 55. Professor GLOVER.

SECOND SEMESTER

Political Economy

1. Elements of Political Economy, I. Principles. Lectures and quiz sections. *Five hours.* Professor TAYLOR, Assistant Professor DOWRIE, Mr. HAYES, and Mr. ROTTSCHAEFER.
This is a repetition of Course I of the first semester.
2. Elements of Political Economy, II. Public Problems. Lectures and quiz sections. *Five hours.* Assistant Professor HAMILTON, Mr. S. M. HAMILTON, Mr. ROTTSCHAEFER, and Mr.

This course is a continuation of the Elements of Political Economy given the first semester. It undertakes a discussion of the application of some of the more important economic principles to problems of current interest. While most of the lectures in this course will be given by Professor TAYLOR, students may expect to hear from other instructors in the department. These lectures will be distributed as follows: Analysis of Problems (3), economics of immigration (6), crises and commercial depressions (6), free trade and protection (10), taxation (3), railway problems (6), trusts and monopolies (6), and government control of industry (3).

- 4a. Seminary in Finance. *Two hours.* Mr. HAYES.
State and Local Taxation will be studied in this course. Instruction will be in the form of reports and discussions on assigned topics. The instructor reserves the right of limiting the number and of selecting from applicants those who are the best fitted to profit by the course. It is designed especially for seniors and graduates. It must be preceded by Course 4.
6. Transportation Problems. Lectures, reading, discussion, and written reports on assigned topics. *Three hours.* Professor SHARFMAN.
This course considers the social and industrial significance of modern transportation, traces the development of railway transportation in this country, and in the more important European countries, studies the history of the railway problems of the United States, and pays especial attention to the control of railways through commissions.
7. Essentials of Economic Theory. *Two hours.* Professor TAYLOR.
Repeated from first semester.

- 11c. Studies in Economic Theory. *Two hours.* Two sections, one for instructors. Professor TAYLOR.
For details see announcement for first semester.
12. Banking. *Two hours.* Assistant Professor DOWRIE.
This course undertakes a study of the history and principles of banking. Attention will be given to the banking systems of the leading countries.
- 12a. Banking Practice. *One hour.* Assistant Professor DOWRIE.
A laboratory course, open only to those who elect Course 12.
14. The Development of Modern Industrialism. *Three hours.* Assistant Professor HAMILTON.
This course attempts an explanation of existing industrial society in terms of development. The past is considered only with this end in view and so far as it can be made to explain contemporary economic culture. Attention is given to such subjects as the development of technique, the differentiation of industrial functions, the integration of industrial activities, the growth of industrial institutions, and the theory of industrial change. The stress of the course falls upon the machine-process, the chief production of the Industrial Revolution, and its effects upon industrial and social thought and institutions. *Laissez-faire*, socialism, and anarchism, as theories of economic "progress," are briefly discussed.
16. Public Service Industries. Lectures, reading, discussion, and written reports on assigned topics. *Two hours.* Professor SHARFMAN.
This course considers the nature of public service industries, such as railroads, street railways, gas and electric companies, telephone and telegraph companies, etc., and their relation to the state and municipality. The problem of public ownership and public control is given careful study on the basis of American and European experience, and special consideration is given to the development of commission regulation in the United States.
18. Research Work in Economics and Finance. A continuation of Course 17.

Sociology

22. Problems in Sociology. Lectures, quiz, and thesis. *Four hours.* Ten quiz sections. Professor COOLEY, Mr. THOMPSON, and assistant.
By special permission students may elect this course as 22a, *three hours*, without the quiz.
This course embraces a study of the laws of population, degeneracy, the liquor problem, poor relief (public and private), vagrancy, crime and penology, the divorce problem, the assim-

ilation of the foreign element in American population, the development of cities, the tenement question, slums, social settlements, and other sociological questions of present interest.

Each student is required to write a thesis, which must be based in part on personal observation.

- 23a. Social Development of the Church. For advanced students. Similar to Course 23. *One hour.* Professor COOLEY. Special permission should be obtained before electing this course.

24. Seminary in Principles of Social Work. *Two hours.* Professor COOLEY.

This course is intended for advanced students who are preparing to follow some phase of social work as a profession. Each student is assigned a special line of study on which he makes a series of reports. Special permission is required before electing the course. Graduate students may be assigned additional work and receive *three hours* credit.

- 24a. Seminary in Psychological Sociology. Advanced study of theory. Intended especially for candidates for the doctor's degree. *Two hours.* Professor COOLEY.

Business Administration

26. Drawing and Projections. *Two hours.* Mr. E. T. COPE.

This course is designed especially to prepare students to comprehend with reasonable precision and completeness blue prints and designs generally, and will embrace the elements of descriptive geometry, machine sketching and drawing, and simple problems in plant layouts.

This course must be preceded by Mathematics 1 and 2.

32. Business Organization and Management. *Three hours.* Professor JONES.

A study of the organization and operation of individual businesses, including a statement of the principles of Scientific Management. Consideration is given to the launching of an enterprise, its financing, the location and design of the plant, and the general plan of administration. The functions of the departments concerned with purchasing, accounting, production, traffic, selling and credit receive attention. Special study is given to the various systems of managing and paying labor.

- 32a. Principles of Administration. *Two hours.* Professor JONES.

A series of studies of great administrators will be arranged for advanced students. The object is to distinguish and formulate the general principles of administration, with special reference to the functions of business executives. Assigned topics for independent work and class discussions. Special permission should be obtained before electing this course.

- [33. Industrial History of the United States. *Two hours.* Professor JONES.
After a brief statement of industrial conditions in the colonies, the growth of western settlement and commerce will be followed to the Civil War to bring out the trade relations which grew up between the northeast, northwest and south. More recent history will be studied largely by industries, attention being given to the evolution of agriculture, lumbering, mining, manufacture and transportation and the resultant types of internal and foreign commerce.
Omitted in 1913-1914.]
35. Investment. *Two hours.* Professor JONES.
The forms of property available for investment will be studied and the conditions affecting their value. Attention will be given to real estate; railroad, public service, timber, irrigation, industrial and other bonds; various classes of stocks; mining securities; and speculation.
- 36a. Railway Accounts. *Three hours.* Lectures, readings, and reports. Mr. LANGMAID.
For description of this course see Course 36, of which it is a continuation.
Students electing this course will be required to attend all special lectures bearing on railway administration.
- 38a. Advanced Accounting Principles and Problems. *Four hours.* Professor FRIDAY and Mr. STEVENSON.
This course is designed to provide for an intensive study of
(a) The Legal and Economic aspects of accounting.
(b) Cost Accounting: an exposition of the utility of cost accounts; the units and elements of cost; the sources of cost data; the measurement of direct costs; the apportionment of indirect costs; the organization of cost systems.
(c) Public Accounting.
- 38E. Principles of Accounting. Course for Engineers. *Three hours.* Professor FRIDAY, Mr. STEVENSON, and Mr. SHUGRUE.
- 38P. Elements of Accounting. Pharmacy course. Quiz and laboratory. *Two hours.* Professor FRIDAY.
Literary students admitted only by special permission.
41. Municipal and Public Accounting. *Three hours.* Professor FRIDAY.
- 45a. Introduction to Law. Lectures, reading, and discussion of selected cases. *Three hours.* Professor SHARFMAN.
This course is a continuation of Course 45, given during the first semester. For a description of the subject-matter of the course, see Course 45.

48. Insurance Accounting. *Three hours.* Mr. STEVENSON.
This course is open only to students who are specializing in actuarial science.
50. Mathematical Theory of Statistics (II). *Two hours.* Elect as Mathematics 50. Professor GLOVER.
52. Introduction to Mathematical Theory of Interest, Insurance, and Statistics (II). Elect as Mathematics 52. Professor GLOVER.
Course 52 is open to those who have completed Courses 1 and 2 (or 1E and 2E) and 51 in Mathematics.
54. Theory of Interest and Life Contingencies (II). Elect as Mathematics 54. Professor GLOVER.
56. Seminary in Actuarial and Statistical Mathematics. Elect as Mathematics 56. Professor GLOVER.

PHILOSOPHY

Candidates for the higher degrees, with major or minor in Philosophy, are requested to communicate with Professor LLOYD as soon as possible, stating their proposed course of study, the subject of thesis, etc.

Related Courses.—Various departments offer courses of special value to students of philosophy. The instructors will be glad to point out the more useful related courses to any student who may make application.

Morris Seminary Rooms.—The greater part of the carefully selected philosophical library of the late Professor George S. Morris (presented to the University by Mrs. Morris) has been removed to the North Wing of University Hall, where Rooms 102 to 106 are Seminary Rooms for advanced courses. Through the continued generosity of Mrs. Morris important additions were made to the Library in 1912-1913.

Philosophical Society.—The Acolytes is a Society to which students, who have distinguished themselves in Philosophy, may be elected on recommendation of the faculty.

Psychological Laboratory.—The Psychological Laboratory occupies fifteen rooms of various sizes in an isolated building on a quiet part of the campus. There are two commodious dark rooms, separate rooms for registration apparatus, one large room for demonstration purposes, and several for research. The rooms are amply supplied with water, gas, high and low voltage currents to furnish power and to replace primary batteries in ordinary experiments.

The equipment includes a complete set of the apparatus required for demonstration and class use, models of the brain and sense organs, a full set of reaction-time instruments, and an unusually large collection of pieces for use in recording the bodily expressions during affective states. The laboratory is also particularly well

equipped for experiments on sound, but not to the exclusion of an adequate supply of instruments for work in other lines. Such apparatus as is needed for advanced work or research will be procured as required, and many of the newest appliances are added each year. Every facility and encouragement are offered to students of sufficient preliminary training to undertake investigations on some special problem.

Important Notice to Students.—There is such wide diversity in the preparation, needs, and aims of individual students that the Philosophical Department cannot lay down inflexible rules with regard to the sequence of its courses; *all students are advised urgently to consult freely with the instructors.* Courses 1, 2 (*a, b, c*), 3, 4, 5 (*a, b, c*), 6, 7, 8 (*a, b*), and 9, precede all others; and any one of them may be chosen as the avenue of entrance to the department and as introducing to other courses. This rule does not apply to students coming with advanced credit, or to special students; all such cases will be decided individually, according to certified attainments and personal requirements. Starred courses should not be elected without consultation.

The following general advice may be given. If possible, students should elect one (preferably Course 1) or more of the nine Introductory Courses in the first or second semester of the sophomore year. If Course 2 (*a* etc.), 3, 4, 5 (*a* etc.), 6, 7, 8 (*a* etc.), or 9 be chosen, it ought to be followed by Course 1. Courses 10-20 inclusive are Second Courses and, with exceptions noted for separate cases as below, may be elected after any one of the Introductory Courses. Courses 12 and 13 should be elected in conjunction with Course 11*a*. Courses 11*c*, 11*d*, 11*e*, 11*f*, 18, 21, and 22 should be elected in conjunction with Course 11*b*. The Psychological Courses (8*b* and 24-30) are subject to special arrangements which may be learned on inquiry.

Students desirous of specializing in Philosophy must begin with Course 1, which should be followed by Courses 9, 11*a*, 11*b*. Further work will be mapped out to meet particular needs.

The following courses are suggested as profitable for particular classes of students: For classical students, Courses 1, 2 (*a* etc.), 6, 11*a*, 12, 13, 16, 26; for students of English and other European Literatures and Rhetoric, 1, 2 (*a* etc.), 5 (*a* etc.), 6, 11*c*, 12, 16; for students of Economics and Administration, 1, 2 (*a* etc.), 5 (*a* etc.), 9, 14*a* and *b*; for students of History, 1, 2 (*a* etc.), 5 (*a* etc.), 11 (*b, c, e, f*), 14*a* and *b*; for students on the Combined Literary and Law Course, 1, 2 (*a* etc.), 5 (*a* etc.), 9, 10, 14*a* and *b*; for students on the Combined Literary and Medical Course, 3, and the courses in Psychology; for students of the Sciences, 1, 3, 22, and (for biological students) courses in Psychology; for students of Architecture, 1, 6, 16*b*. Students preparing for theological seminaries are advised to elect Courses 1, 2 (*a* etc.), 5 (*a* etc.), 9, 10, 15, 21, and courses in the history of philosophy.

Students preparing to teach Psychology are required to take Courses 1, 8c, 9, 11b, 24, 25, and Anatomy, Course 4 (Anatomy of the Nervous System). Students preparing to teach, whether Psychology or not, are advised to elect Courses 1, 7, 12, 24, and 25.

Consultation Hours.—(a) At beginning of first semester, to aid students in making their elections, *M*, 29th, *Tu*, 30th Sept., *W*, 1st Oct., 1913, at 11-12 A. M., in the Morris Reading Room, 106, N. W.

At the close of first semester, the following consultation hours will be held to aid students in making their elections for the second semester: *W*, *Th*, *F*, 21st, 22d, 23d, Jan., 1914, at 11-12 A. M., in the Morris Reading Room (106, N. W.).

Consultation hours of the staff for both semesters will be announced.

First meeting of courses announced *with hours to be arranged*:—

First Semester:—(a) All undergraduate courses in Philosophy in the Morris Reading Room (106, N. W.) on *W*, Oct. 1st, 1913, at 1 P. M., to fix hours.

(b) All undergraduate courses in Psychology in the Psychological Laboratory on *Th*, 2nd Oct., 1913, at 1 P. M., to fix hours.

(c) All graduate students proposing majors or minors in Philosophy or Psychology will meet the staff, to arrange hours, on *M*, Oct. 6th, 1913, in the Morris Reading Room (106 N. W.), at 1 P. M.

Second Semester:—(a) All undergraduate courses in Philosophy in the Morris Reading Room (106, N. W.), on *Tu*, 10th Feb., 1914, at 1 P. M., to fix hours.

(b) All undergraduate courses in Psychology in the Psychological Laboratory on *W*, 10th Feb., 1914, at 1 P. M., to fix hours.

(c) All graduate students proposing majors or minors in Philosophy or Psychology will meet the staff, to arrange hours, on *F*, 13th Feb., 1914, at 1 P. M., in the Morris Reading Room (106, N. W.).

Departmental Adviser.—Assistant Professor VIBBERT will act as Adviser to philosophical students during the first semester. He will be in the Morris Reading Room (106, N. W.), *Tu*, 10-11, and *Th*, 12, (a) to give out books from the Morris Library, (b) to advise with students particularly as to books recommended for reading, and as to literature to be consulted for exercises and theses.

Professor WENLEY will act as Adviser during the second semester. His hours will be announced at the beginning of the semester.

FIRST SEMESTER

I. *Introductory Courses.*

- I. Philosophical Introduction. Lectures, discussion sections, exercises. *Three hours.* Professor WENLEY, Assistant Professors VIBBERT and SELLARS.

The object of this course is to explain to beginners in the most elementary manner possible, the meaning, interest, and scope of philosophy; to compare its outlook with other standpoints,

such as those of the average man (common-sense), of history, and of science (including Psychology). Text-books: Bertrand Russell's *The Problems of Philosophy* (H. Holt, New York); Berkeley's *Three Dialogues between Hylas and Philonous*, and Hume's *Inquiry Concerning Human Understanding*. (Open Court, Chicago). This is a *three-hour* course; every student will attend one discussion section per week; this in addition to the two lectures; after the beginning of the semester, the class will be divided into sections for this purpose, and each student will have an opportunity of electing the hour most suitable for the section work.

- 2b. Principles of Ethical and Social Evolution. *Two hours.* Professor WENLEY.

This course is intended specially for (1) students of literature, ancient and modern, and (2) students of sociology, history, and politics. It is one of the courses recommended to students of commerce and public administration. Subject in 1913:—The Outlook at the time of the appearance of Christianity. Students are advised that *three* courses fall under 2, viz., 2a, 2b, and 2c. As each course is complete in itself, all may be elected, and in any order. They deal with phases of ethical and social development prior to the French Revolution. To be followed by courses under 5 (which see). Text-book, Dill's *Roman Society* from Nero to M. Aurelius (Macmillan) collateral reading; one thesis.

- 3a. The Principles and Main Concepts of Science. *Three hours.* Assistant Professor SELLARS.

This course is designed primarily for students of Physics, Chemistry, and Biology; also for all who desire to grasp the presuppositions of the scientific standpoint, and is open to all who are interested in the progress of modern thought. The Postulates of Science. The place of general concepts in science. The main conceptions employed in the syntheses of Physics, Chemistry, and Biology—what they imply; how they subserve the knowledge of Nature; their necessary conditions and limits.

7. Elementary General Psychology. Lectures, assigned readings and discussions. Text-book, Pillsbury's *Essentials of Psychology*. *Three hours.* Professor PILLSBURY and Dr. ADAMS. A rapid survey of the facts of mind. Intended primarily for students of pedagogy, but open to others who are not interested in the experimental and physiological aspects of Psychology.

- 8a. Introductory Physiological and Experimental Psychology. Sensation, Attention, Association. Professor PILLSBURY, Assistant Professor SHEPARD, and Dr. ADAMS.

It is suggested that six-year literary-medical students, students of biology, and others who desire more than the rudiments of

psychology begin their work with this course. Lectures, discussion, and laboratory work. It may be elected as 8a (*three hours*) without laboratory work, as 8c (*four hours*), with two lectures and four hours of laboratory work, or as 8e (*five hours*), with three lectures and four hours of laboratory work. Students who have had previous work in psychology and desire only the laboratory work and discussion sections may elect it as a three-hour course. Text-books: James's *Principles of Psychology*; Pillsbury's *Attention*; Myer's *Experimental Psychology*; or Ladd's and Woodworth's *Physiological Psychology*.

II. *Course in Logic.*

10. Advanced Course in Logic. *Three hours.* Assistant Professor PARKER.

An introduction to the study of fundamental logical concepts. The elements of the theory of propositions, class, relations, series, number, quantity, and space. The logical basis of the exact sciences. Lectures, reading, and reports. Follows Course 7 or 9.

III. *Courses in History of Philosophy.*

- 11a. History of Ancient Philosophy from Thales through Aristotle. Lectures, reading, exercises. *Three hours.* Professor LLOYD. Open to approved students who have had any of the introductory courses or an equivalent.

- [11c. Kant, Hegel, and Anglo-American Idealism after 1865. *Three hours.* Professor WENLEY.

This course covers the second main period in the history of Modern Philosophy. The aim is to exhibit the nature of German Idealism, and to outline its widespread influence in the English-speaking countries. Text-books: Wenley's *Kant and His Philosophical Revolution* (Scribner), and Caird's *Hegel* (Lippincott). Two lectures each week, the third hour to be devoted mainly to elucidation and discussion of special points. Omitted in 1913-1914.]

12. The Philosophy of Plato. *Two hours.* Assistant Professor PARKER.
A study of the chief Dialogues (in translation). Lectures, discussions, and prescribed reading.

IV. *Special Courses.*

13. German Pessimism in the 19th Century. *Two hours.* Assistant Professor VIBBERT.

A detailed study of the works of Schopenhauer, von Hartman and Nietzsche with reference not only to their philosophical but also to their general literary and social significance.

Lectures, discussions, theses.

- 14a Political Philosophy. Lectures, discussions, theses. *Two hours.* Professor LLOYD.
A history of the theories of society, ancient and modern. Attention will be given especially to the contract theory of the seventeenth and eighteenth centuries. Students who have had Course 1; or Course 11a, b, or c; or Courses 2a, b, or c, and 5a, b, or c; or Courses 5a, b, or c and 20, will be admitted. These form a minimum preparation; but two courses in philosophy proper (e. g., Courses 1 and 2a, b, or c; or 1 and 5a, b, or c; or 1 and 20) are strongly recommended as preparation.
15. Philosophy of Religion. Lectures, prescribed reading and exercises. *Two hours.* Professor WENLEY.
This course is recommended to students who propose to follow the ministry, and to those who are interested in the relation of religion to modern life.
16. Aesthetics. Lectures, prescribed reading, and a thesis. *Three hours.* Assistant Professor PARKER.
The definition, forms, and standard of Beauty. The application of general æsthetic principles in poetry and the fine arts. The relation of art to science, morality, religion, and philosophy. Lectures, reading and a thesis.
- *17a. Logic and Theory of Knowledge. *Two hours.* Professor LLOYD.
A study of fundamental problems, with special reference to the grounds of realistic experience. The course is open only to approved students familiar with the general history of philosophy. Lectures, exercises, and collateral reading.
18. Contemporary Ethical Problems. *Three hours.* Assistant Professor SELLARS.
This course will concern itself with the vital ethical and social problems of the present. So far as possible the subjects taken up will be given an historical setting.
- *21a. Philosophical Implications of Contemporary Movements of Thought. *Two hours.* Assistant Professor VIBBERT.
The course will comprise: (1) the new scientific Nominalism, a critique of the methods and value of science represented by M.M. Poincare, Milhaud, Duhem, LeRoy, et al; (2) Neo-vitalism, a critique of the mechanical type of explanation in biology; (3) Modernism, a critique of the nature and worth of religious dogmas; (4) Philosophy of Action, a critique of the limitations of intellect with reference to a complete formulation of the meaning of life.
21. Pragmatism. *Two hours.* Assistant Professor VIBBERT.
A critical study of the contemporary movement in Anglo-American Philosophy, in its two main lines of development:—
(1) Professor William James, and Dr. F. C. S. Schiller;
(2) Professor Dewey and his pupils. Examination of prob-

lems such as, the Practical Criterion of Truth, the Unmediated Character of Experience, the Making of Reality, the Plural Nature of the Universe. Lectures, discussions, and a thesis.

V. Courses in Psychology.

*24. Advanced Systematic Psychology. Lectures on attention, association and the more complicated mental processes. Text-book, Pillsbury's *Attention*. *Two hours*. Assistant Professor SHEPARD.

*24a. Special Problems in Physiological Psychology. This correlates with Course 24 and the two may be elected together as a three hour course. 24a may be elected alone as a one-hour course with the permission of the instructor. *One hour*. Assistant Professor SHEPARD.

*24d. Advanced Psychology of Advertising. Dr. ADAMS.

Primarily for graduates. Reports on the literature of the subject and laboratory work on the more important psychological phases of advertising.—*Two or more hours, to be arranged*.

25b. Experimental Aesthetics. Dr. ADAMS.

Lectures and laboratory. The course will deal with the simpler or elementary art forms, particular attention being paid to forms and colors.—*Two hours, to be arranged*.

*26. The Psychology of Language. Among the subjects treated are the laws of thought and language, the history of linguistic theory, language as a form of expression, the genesis of speech, and the psychology of syntax. Elect as General Linguistics, 26. *Two hours*. Professors PILLSBURY and MEADER.

Professor SCOTT will give four lectures on the origin of language.

*26a. History of Modern Psychology. Primarily for graduates. Will present the more important tendencies in psychology since Descartes, in the endeavor to give an historical origin to current theories. *Two hours* Professor PILLSBURY.

[27. Psychology of Memory. A study of the recent memory investigations. The results, methods and instruments will be studied, and some of the more important experiments will be repeated. Some time will also be devoted to a study of the experimental investigations of legal evidence, the *Ausage* experiments of Stern and others. *Two hours*. Professor PILLSBURY. Omitted in 1913-1914.]

*29. Psycho-physical Methods and Laboratory Technique. Discussion and laboratory work. *One hour*. Assistant Professor SHEPARD.

*30. Advanced Course in Experimental Psychology. Original investigation. *Credit to be arranged*. Professor PILLSBURY, Assistant Professor SHEPARD, and Dr. ADAMS.

VI. Graduate Seminaries.

*—, Graduate Seminaries. These are arranged in order to give flexibility to the special work of graduate students whom the announced graduate courses do not suit. The work in them will be apportioned as follows:

- (1). Ancient Philosophy:—
 - a. Origins to Socrates. Professor LLOYD.
 - b. The Platonic Philosophy. Assistant Professor PARKER.
 - c. The Aristotelian Philosophy. Assistant Professor SELLARS.
 - d. The Hellenistic Period.—Græco-Roman Schools and Movements. Professor WENLEY.
 - e. Neo-Platonism. Assistant Professor PARKER.
- (2). Mediæval Philosophy. Assistant Professor PARKER.
- (3). Modern Philosophy:—
 - a. Renaissance-Cartesian Period, to Leibniz. Professor LLOYD.
 - b. The Critical Philosophy of Kant. Professor WENLEY.
 - c. British Empiricism, First Period. Assistant Professor SELLARS.
 - d. German Philosophy since Hegel. Professors WENLEY and LLOYD, Assistant Professors VIBBERT and SELLARS.
 - e. French Philosophy in the Nineteenth Century, First Period. Assistant Professor VIBBERT.
- (4). Metaphysics. Professors WENLEY and LLOYD, Assistant Professors VIBBERT, SELLARS, and PARKER.
- (5). Logic. Professor LLOYD, Assistant Professors SELLARS and PARKER.
- (6). Epistemology. Assistant Professors VIBBERT, and SELLARS.
- (7). Ethics. Professors WENLEY and Assistant Professor VIBBERT
- (8). Philosophy of Religion, First Period, to Kant. Professor WENLEY.
- (9). Æsthetics. Subjects in the philosophy and psychology of Beauty and Art will be selected for study in accordance with the needs of advanced students. Assistant Professor PARKER.
- (10). Political Philosophy. Professor LLOYD.
- (11). Psychology—Systematic and Experimental. Abnormal and Pathological. Professors PILLSBURY, BARRETT, and CAMP, Assistant Professor SHEPARD, and Dr. ADAMS.

SECOND SEMESTER

- I. Introductory Courses* (see notice prefixed to announcement of courses in this department.)
1. Philosophical Introduction. *Three hours.* Professor WENLEY, Assistant Professors VIBBERT and SELLARS.

- 5c. Ethics of Social Evolution: a Study of Ethical Types as seen in Social and Industrial Relations. *Two hours.* Professor WENLEY.

This course is designed specially for students of (1) history, (2) law and sociology, (3) commerce and administration. The problems will be approached from the standpoint of social organization. The ethical significance of social, and political institutions will be considered, also the relation of these institutions to the conditions of moral progress and stability in a society. Questions will be set for the individual consideration of students, with reference to the line of study they are pursuing. Subject in 1913-1914: Contemporary Ethical changes, with particular reference to the English speaking peoples. Students are advised that *three* courses fall under 5, viz., 5a, 5b, 5c. As each course is complete in itself, all may be elected, and in any order. They deal with phases of ethical and social development subsequent to the French Revolution.

6. The History of Aesthetics. *Three hours.* Assistant Professor PARKER.

The development of æsthetic theory in relation to the contemporaneous social, philosophical, and artistic movements. The analysis and discussion of representative contributions to this theory. Special attention will be paid to the modern period beginning with Kant. Lectures, reading and reports.

7. Elementary General Psychology. Same as in first semester (which see). *Three hours.* Professor PILLSBURY and Dr. ADAMS.

9. Introduction to Logic. Lectures, collateral reading, and text-book work. Text-book: Jones' *Logic, Inductive and Deductive*. Course 1 is the natural prerequisite to this course. *Three hours.* Assistant Professor SELLARS.

II. *Courses in History of Philosophy.*

- 11b. History of Modern Philosophy from St. Augustine through Kant. Lectures, reading, and reports. *Three hours.* Professor LLOYD.

The course is open to approved students who have had any one of the introductory courses or an equivalent. Course 11a, while not required, furnishes desirable preparation for this course.

- [11c. British Evolutionism and German Neo-Kantianism after 1850. *Two hours.* Assistant Professor SELLARS.

Will alternate with 11c. Omitted in 1913-1914.]

- 11f. Contemporary French Philosophy. *Three hours.* Assistant Professor VIBBERT.

This course will consider French thought after the decline of Eclectic *Spiritualisme*, and will be devoted to later French

Philosophy of the School of Boutroux, Bergson, and their associates. In some respects, this is the most vital manifestation of contemporary thought. Two lectures each week; the third hour to be devoted mainly to elucidation and discussion of special points.

13. The Philosophy of Aristotle. *Two hours.* Assistant Professor SELLARS.

Aristotle and the completion of Greek thought. The Fundamental Principles of his System. The Parts of the System. Aristotle's relation to subsequent thought.

III. Courses in Ethics.

- 9a. The Ethics of German Idealism. *Two hours.* Assistant Professor PARKER.

A study of the ethical systems of Kant, Fichte and Hegel, in relation to the general philosophy of these thinkers. Lectures, reading, and reports.

19. Problems of Human Conduct. *Two hours.* Professor LLOYD.

A study of the moral ideal, motive and judgment, of conscience and will. An elementary course in ethical theory, partly historical and partly critical and constructive, which is open to all students who have had any one of the introductory courses in philosophy, or an equivalent.

IV. Special Courses.

4. Metaphysics. *Three hours.* Assistant Professor PARKER.

A study of ultimate problems; the issues between empiricism and rationalism, idealism and realism, monism and pluralism. The categories and inter-relation of the physical, personal, and logical forms of Reality. Lecture, readings, and reports.

- 14b. Political Philosophy—Special Course. *Two hours.* Professor LLOYD.

A critical study of society; the principles of political association and evolution; progress, the relations of political and industrial institutions to fundamental ideas of philosophy and religion; the personal and the social. This course is recommended to students of history, to those who have had or intend to take Course 14a, and to students of economics and sociology.

- 17b. Logic and Theory of Knowledge. Lectures, exercises, and collateral reading. A continuation of 17a; but may be elected (after consultation) by students of sufficient preparation who have not had 17a. *Two hours.* Professor LLOYD.

- *20a. Theory of Knowledge. *Two hours.* Assistant Professor SELLARS.

An introduction to Theory of Knowledge. Special stress will be laid upon contemporary movements in Realism and the criticism of the postulates and analyses of Idealism they involve.

Representative articles by British thinkers, such as G. E. Moore and Bertrand Russell, and by various American groups will be studied. One of the aims of the course is to familiarize the student with the philosophical journals.

- *22. Philosophy of Evolution. *Two hours.* Assistant Professor VIBBERT.

Investigation of some of the difficulties involved in the concepts of Becoming, Time, and Process, in contemporary Philosophy. Comparative treatment of Hegel's view of Time, Spencer's view of Evolution, Wundt's theory of Becoming, and Bergson's conception of *la Durée Pure*. Lectures, discussions, and a thesis.

- *23. Philosophy of Valuation. *Two hours.* Assistant Professor VIBBERT.

A critical study of the concept of Value, with reference to determination of the problem of the origin of Values, and the standards whereby Values are maintained. Particular attention will be given to the theories of Value and of the Austrian school of psychologists—Meinong and his pupils. Lectures, discussions and a thesis.

V. *Courses in Psychology.*

- 8b. Introductory Physiological and Experimental Psychology. Feelings, emotions, and the higher intellectual processes. Professor PILLSBURY, Assistant Professor SHEPARD and Dr. ADAMS.

Continuation of Course 8a. This course may, by special permission, be elected as an introductory course without being preceded by Course 8a. It may be elected as 8b, *three hours*; as 8d, *four hours*, with two lectures and four hours of laboratory work, or as 8f, *five hours*, with three lectures and four hours of laboratory work.

- 24c. Psychology of Advertising. A survey of the psychological principles involved in advertising with experimental study of the relative value of different types of advertisements. *Two hours.* Dr. ADAMS.

- *25. Comparative Psychology. *Two or three hours.* Assistant Professor SHEPARD.

A study of the evolution of mental processes, and their comparative development in different forms. The lectures will be accompanied by laboratory work on the learning processes in animals. The course may be elected as 25 (*two hours*), without laboratory work, or as 25a (*three hours*), with the laboratory. For those proposing to teach, this course should follow Course 24.

- *26b. History of Modern Psychology. Professor PILLSBURY.
Continuation of Course 26a.

- *26c. General Course in Experimental Phonetics. Lectures and laboratory work. This course, which is designed for students of language, psychology, oratory, and singing, will deal with the anatomy and physiology of the human voice, the production of speech sounds, description and classification of speech sounds, mechanical methods of recording speech sounds, study of speech records. As the number of students admitted to this course will be small, those desiring to elect it are advised to apply early to one of the instructors in charge. *One hour.* Professor MEADER and Assistant Professor SHEPARD. This course should be elected as General Linguistics 26c.
28. Psychology of the Abnormal and Occult. *Two hours.* Professor PILLSBURY.
A critical survey of the more important facts of mental derangement that throw light upon the principles of general psychology. The more interesting forms of modern occultism will be considered in their bearings upon psycho-pathology.
- *30b. Advanced Experimental Psychology. As in Course 30, in first semester. Professor PILLSBURY, Assistant Professor SHEPARD, and Dr. ADAMS.

VI. Graduate Seminars.

Graduate Seminars. As in first semester, (which see), with the following changes:

- (1). Ancient Philosophy:—
 - d. The Hellenistic Period; the Pagan Reaction and Philosophy in the Roman Empire. The beginnings of Christian reflection. Professor WENLEY.
- (2). Modern Philosophy:—
 - b. The Hegelian System and its Influence. Professor WENLEY.
 - c. British Empiricism, Second Period; the Theory of Evolution. Assistant Professor SELIARS.
 - e. Contemporary French Philosophy. Assistant Professor VIBERT.
- (8). Philosophy of Religion; Second, or Systematic, Period, from Hegel. Consequences of the Historical and Comparative Methods. Influence of the Natural Sciences. Professor WENLEY.

EDUCATION

General Statement.—Course 7 in Philosophy is prerequisite to work in Education. It should be taken in the sophomore year. This course does not count towards the Teacher's Diploma.

The aims of the courses in Education are:

1. To offer to prospective high school teachers, normal school teachers, principals, and superintendents the necessary technical training for their profession.

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2. To present educational history and problems in their more philosophic and scientific aspects so as to be of value to all university students, whether they intend to become teachers or not.

3. To offer to mature students and to teachers of experience, who may wish to elect work in Education as a major or minor subject, direction and facilities leading to higher degrees.

The courses are arranged with reference to three fairly distinct phases of education, the historical, the theoretical or scientific, and the administrative.

Requirements for Admission.—Two years of academic preparation are prerequisite to work in Education. This requirement may be waived in special cases.

Introductory Courses.—Courses 1 and 2 are introductory courses and should be taken in the junior year. All other courses are open only to seniors and prospective superintendents and principals, except by special permission of the head of the department.

Superintendents and Principals.—Students looking forward to superintendencies and principalships should pursue in addition to the work required for a Teacher's Diploma courses in advanced administration, psychology of special subjects, school hygiene, and at least one seminary.

Observation.—Arrangements have been made between the University and the Public Schools of Ann Arbor, whereby students in Education are given opportunity to study methods of teaching the various subjects of the curricula in both the high school and the W. S. Perry elementary school. Students seeking a Teacher's Diploma are classified into groups and required to observe expert teaching of their major or minor subjects. Observation is accompanied by written reports, conferences, and collateral reading.

Teacher's Diploma.—Candidates for the Teacher's Diploma are required to complete eleven hours of credit in this department, including Courses 2, 4a, b, c, d, e, or f, 5, and 13 or 32. Superintendents and principals of experience may substitute, by permission, Course 16a or 16b for Course 13 or 32.

Any student desiring a Teacher's Diploma should complete Course 2 or its equivalent before pursuing advanced work in Education. Advanced credit from other universities, or from colleges or normal schools, will be granted toward such Diploma as consideration of individual cases may warrant. No credit will be given for experience in teaching.

Graduate Courses.—Courses leading to the master's or doctor's degrees are offered for advanced students in Education. These courses must be preceded by Courses 2, 4, 5, and 13, or their equivalent. Saturday classes will be arranged for teachers, principals, and superintendents now in service if there is sufficient demand for such work.

Consultation Hours.—The instructors in this department will have consultation hours as follows:

Professor WHITNEY, first week of each semester from 9-12; thereafter daily at 1:30. Room 102, T. H.

Professor DAVIS, daily at 1:30. Room 102, T. H.

Assistant Professor BERRY, *Tu, Th*, at 10. Room 105, T. H.

Assistant Professor BREED, *W, F*, at 10. Room 105, T. H.

Assistant Professor JACKSON, *W, F*, at 11. Room 106, T. H.

FIRST SEMESTER

I. Historical Courses.

1. History of Education—Ancient and Mediæval Periods. *Two hours.* Two sections. Professor DAVIS and Assistant Professor JACKSON.

Lectures, assigned readings, and discussions.

This course attempts to show the relationship between the social, religious, and intellectual changes and the varying conceptions of aim, method, curriculum, and organization during the periods indicated. The actual conditions of society and the actual work and aim of the schools are studied, and a basis is thus given for a better understanding of the meaning of educational problems.

2. History of Education—Modern Period. *Two hours.* Three sections. Assistant Professor JACKSON.

This course is similar to Course 1 in aim and method of treatment. It deals with the progress of society and related educational problems from the Renaissance to the present time and attempts to show the origin and evolution of present theory and practice in education.

31. History of Education in Michigan. *One hour.* Professor DAVIS. Lectures, readings, reports and discussions.

The aim of this course is to give the teachers of Michigan an appreciation of the social significance of our present educational institutions and a perspective for viewing the present educational system of the state. The course should also prove interesting to those who pursue it merely as an aspect of general history and of general culture. The first portion of the course deals with the general phases of the history of education as typical of the nation. The limits will then be contracted to include the educational movement in the Old Northwest, and finally a more detailed study will be made of the history of education in Michigan.

- 38a. Seminary in the History of Education. *Credit to be arranged.* Assistant Professor JACKSON.

Special topics in the History of Education will be investigated.

II. *Theoretical Courses.*

5. Psychology of Education. *Two hours.* Six sections. Assistant Professors BERRY and BREED.

Lectures, selected readings, discussion, exercises, and reports. Psychological theory as a basis for educational practice; results of recent experimental research in psychology and modern theories of the structure and function of the mind in their practical bearing upon methods of educational procedure.

6. Principles of Education. *Two hours.* Assistant Professor BREED.

This course aims to sketch a general background for educational thought and practice. The educative process is examined from the biological, psychological, philosophical, and religious points of view. Educational ideals and values are studied critically and constructively, a theory of the curriculum is outlined, and the important values of the various studies are briefly touched upon.

7. Mental Development. *Two hours.* Assistant Professor BREED.

The central aim of this course is to trace the growth of the mind from infancy to maturity. Among the topics considered are: The origin of the important sense modes, a history of the various types of action, a detailed study of the nature and educational employment of the instincts of children, the relation of heredity and environment as conditions of mental development, the changes with age of the principal intellectual processes, and a special study of the psychology of adolescence in its relation to the problems of secondary school instruction and training.

This course is especially arranged for the accommodation of superintendents, principals, and other teachers now in service.

11. Educational Theories of the Greeks. *Two hours.* Assistant Professor BERRY.

Actual systems of education at Sparta and Athens; educational importance of the Sophists; Plato's *Apology*, *Crito*, and *Protagoras*; and a more detailed study of the text of Plato's *Republic* and of selections from Aristotle's *Ethics* and *Politics* in translation.

- [34a. Seminary in Educational Psychology. Assistant Professor BREED.

This course is intended primarily for graduate and other advanced students. Introductory work in the psychology of education is presupposed. Opportunity for research is provided. Subjects for the year: The Doctrine of Interest, and the Doctrine of Formal Discipline. Typical modern attitudes toward the above doctrines are examined. The basis for criticism is laid in a study of instincts, native and acquired interests, effort and will, the laws of habit formation, means and amounts of "transfer," types of learning, and the functional view of mind. Omitted in 1913-1914.]

- 40b. Psychology and Pedagogy of the Elementary School Subjects.

Two hours. Assistant Professor BREED.

Study of recent investigations in the psychology and experimental pedagogy of writing, spelling, and language. This course is intended primarily for those who expect to become superintendents.

42. Mental Measurements. *Two hours.* Assistant Professor BERRY.

This course is an application of psychological and statistical methods of education. Among other subjects it involves a study of psychological units and scales, the treatment of central tendencies and correlation, as exemplified in the studies of heredity, etc.

III. Administrative Courses.

13. Secondary Education. Introductory Course. *Two hours.* Four sections. Professors WHITNEY and DAVIS.

Assigned readings, reports, and discussions.

This course aims to meet the needs of inexperienced, undergraduate students who desire to make a systematic study of secondary school problems. Among the topics treated are: the proper place and function of the high school; organization and administration; discipline; program of study; methods of instruction; examinations and promotions; relation of high school to other social institutions; and relation of high school to college and to practical life. Each student will be required to observe general methods in the public schools of Ann Arbor for at least one period per week during the semester.

- 16a. School Administration. *Two hours.* Professor WHITNEY.

Lectures, readings, reports, theses.

This course is designed for those experienced teachers who are looking forward to positions as principals, supervisors, or superintendents; others are admitted by permission. The aim of the course is to discuss those practical problems which relate to organization, administration, and supervision. Special attention is given to grading and promotion, training of teachers, tests of efficiency, discipline, course of study, analysis of text-books, and comparison of city school systems.

18. The High School Program of Studies (Curriculum). *Two hours.* Professor DAVIS.

This course traces briefly the historical development of the program of studies (curriculum) in secondary schools; seeks to discover the principles of program construction; considers the criticisms directed against the existing high school programs of studies; attempts to evaluate each of the subjects found today in the high school, to judge of its scope, time allotment, and position in the course and to suggest modes of its correlation and general methods of its presentation; makes a study of typical programs; and endeavors to formulate a satisfactory program for the high schools of today.

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- 39a. Seminary in Educational Administration. *Two hours.* Professor WHITNEY.
Research work in problems of administration.

SECOND SEMESTER

I. Historical Courses.

1. History of Education—Ancient and Mediaeval Periods. *Two hours.* Assistant Professor JACKSON.

Lectures, assigned readings, and discussions.

This course attempts to show the relationship between the social, religious, and intellectual changes and the varying conceptions of aim, method, curriculum, and organization during the periods indicated. The actual conditions of society and the actual work and aim of the schools are studied, and a basis is thus given for a better understanding of the meaning of educational problems.

2. History of Education—Modern Period. *Two hours.* Three sections. Professor DAVIS and Assistant Professor JACKSON.

This course is similar to Course 1 in aim and method of treatment. It deals with the progress of society and related educational problems from the Renaissance to the present time and attempts to show the origin and evolution of present theory and practice in education.

27. History of Education in America. *Two hours.* Assistant Professor JACKSON.

Lectures, reports, assigned readings, and discussions.

This course traces the growth of our public school system from its origin to the present time. It deals with the development of elementary, secondary, and higher education; and with such special topics as the evolution of school support, school supervision, the school district, the influence of European ideas on theory and practice, and state school systems.

- 38b. Seminary in the History of Education. *Credit to be arranged.* Assistant Professor JACKSON.

This course is a continuation of Course 38a. New students may be admitted on permission of the instructor.

II. Theoretical Courses.

- [7. Mental Development. Assistant Professor BREED.

Lectures, discussions, prescribed readings, and reports.

The central aim of this course is to trace the growth of the mind from infancy to maturity. Among the topics considered are: The origin of the important sense modes, a history of the various types of action, a detailed study of the nature and educational employment of the instincts of children, the relation of heredity and environment as conditions of mental development, the changes with age of the principal intellectual processes and a special study of the psychology and adolescence in its relation to the problems of secondary school instruction and training. Omitted in 1913-1914.]

12. Moral Education. *One hour.* Assistant Professor BERRY.
Lectures, prescribed readings, and reports.
An analysis of the moral nature of the child with a view to a critical study of existing and proposed means and methods of moral education.
 20. School Hygiene. *Two hours.* Assistant Professor BERRY.
Lectures, readings and reports.
The work of this course considers the physical welfare of the child in its relation to his moral and intellectual development. It involves the study of school legislation relative to school hygiene, heating, lighting, and ventilating of school rooms, physical exercise, medical inspection, nature of communicable diseases, detection and treatment of the defects of the senses, laws of fatigue, hygienic programs, etc.
 29. Advanced Educational Psychology. *Two hours.* Assistant Professor BERRY.
Lectures, required readings, and reports.
This course is especially designed for advanced students. Course 5 or its equivalent is a prerequisite. The plan of the introductory course will be followed with more intensive treatment of the nature of the various mental functions and the practical relations involved.
A Saturday class will be arranged for superintendents, principals, and other teachers now in service.
 33. The Psychology and Education of Exceptional Children. *Two hours.* Assistant Professor BERRY.
The extent and significance of individual differences; classification of exceptional children, with a discussion of their psychological differences; study of Binet's measuring scale and other tests of intelligence; methods and subject-matter used in the education of subnormal and supernormal children.
 - [34b. Seminary in Educational Psychology. Assistant Professor BREED.
This course is a continuation of 34a. New students may be admitted on permission of the instructor. Omitted in 1913-1914.]
 - 40a. Psychology of the Elementary School Subjects. *Two hours.* Assistant Professor BERRY.
A study of recent investigations in the psychology of reading and arithmetic in their relation to educational practice. This course is intended especially for those who expect to become superintendents.
- III. *Administrative Courses.*
- 4a. Observation and special Methods in Greek and Latin. *One hour.* Assistant Professor CRITTENDEN.
Lectures, readings, conferences, and critiques.
Practical application of the principles of class management; aims and values of the classics; the courses of study; out-

lines of the work as regards quantity, quality and method; special consideration of the stress to be laid upon such features as pronunciation, vocabulary, syntax, translation, etc.; examination of some of the text-books now in use.

Twenty hours of high school observation are required of each student.

- 4b. Observation and Special Methods in German. *One hour.* Assistant Professor EGGERT.

Lectures, conferences, reports, readings and discussions.

The aim of this course is to consider principles of the recitation unit, to give opportunity for the observation of these principles as applied in practice, and to consider the principles underlying the teaching of modern language. Such problems as text-books, pronunciation, proper use of translation will be given careful attention.

Twenty hours of high school observation are required of each student.

- 4c. Observation and Special Methods in English. *One hour.* Assistant Professor RANKIN.

Lectures, conferences, reports, and collateral readings. The aim of this course is to consider the fundamental principles of a class recitation and to offer to students in Education opportunity to observe the practical demonstration of these principles in teaching composition and literature. Careful consideration is given to formal grammar, the aims, values, and methods of teaching composition and literature, the course of study, and such other factors as pertain to the instruction of English in the high schools. Students are required to observe twenty recitations during a semester.

- 4d. Observation and Special Methods in History. *One hour.* Professor DAVIS.

Lectures, conferences, reports, readings, and discussions.

The aim of this course is to give inexperienced but prospective teachers of history an opportunity to study the special problems of the classroom and to consider the special aspects of methods involved in history teaching in secondary schools. The work will consist of lectures and exercises dealing with such topics as the aims of history teaching, the relation of history to literature, biography and science; the sequence of the various divisions of the subject; the proportionate emphasis to be accorded different phases of history; the organization of material; the use of text-books and notebooks; the use of outlines, maps, charts, blackboards, reference books, source material, pictures, lantern slides, and other illustrative helps; tests and examinations; reports and reviews; lesson planning; types of recitation; the art of questioning; assignment of lessons, and other topics involving the technique of the recitation.

Each student will be required to spend twenty hours during the semester observing the classroom work in the Ann Arbor High School.

4e. Observation and Special Methods in Mathematics. *One hour.*

Professor MARKLEY.

Lectures, readings, and conferences.

The application of the principles of class management to concrete situations; the aims and values of mathematical study; the course in mathematics for the secondary school; classification and critical consideration of special methods and modes; comparison of text-books. Twenty hours of high school observation during the semester.

4f. Observation and Special Methods in Biology. *One hour.* Professor POLLOCK.

Lectures, conferences, reports and discussions of observations.

Twenty hours of observation during the semester of Biology teaching in the Ann Arbor High School. One hour per week for conference.

In the conference hour there will be considered first the laboratory and its equipment, then the educational value of the natural sciences, how this value is to be obtained, and its relation to the method of teaching the subject. Lastly, a course of study will be discussed in detail for botany with reasons for the choice of material. A detailed outline for a number of field trips will be worked out. The phases of botany, especially valuable as a basis for agriculture, will be indicated. Conference hour to be arranged on consultation with students.

14. Social Education. *Two hours.* Two sections. Professor WHITNEY.

A study of the school as a social factor in its relation to the home, the community, the state, and the church. Among the topics treated are: The social basis of education; the social extension of the school; continuation schools; school and the business world; parental schools; the juvenile court; self-governing clubs; the boy problem; education and crime; industrial education; agricultural education; athletics; course of study; six-year high school; social study period and recitation, and high school fraternities.

16b. School Administration. Special Problems. *Two hours.* Professor WHITNEY.

This course is a continuation of 16a. Students of considerable experience in teaching may be admitted by permission. The aim of the course is to study special administrative problems, such as individual differences in their relation to retardation, elimination, and promotion of pupils; school statistics and reports; standards of efficiency; and such other problems as pertain to scientific school procedure.

17. Comparative School Systems. *Two hours.* Professor DAVIS.
Lectures, prescribed readings, and reports.
This course is designed to present the essential features of the school systems of the United States, England, Germany, and France; to compare these systems with each other, and to judge of the efficiency of each in the light of their respective educational aims and national ideals. Among the topics treated are organization, supervision, curriculum, methods of teaching, continuation schools, technical schools, universities, etc.
32. Secondary Education. Advanced Course. *Two hours.* Professor DAVIS.
This course aims to meet the needs of superintendents, principals, and experienced teachers who desire to make a detailed study of the general problems of organization, administration, and management of high schools, and such special contemporary problems as are at present forcing themselves for solution. Among the topics considered are the principles of scientific educational investigations; the aim of the secondary school; the problems growing out of the age of the pupils; problems relating to the curricula, their scope, intensiveness, and flexibility; the high school as a social institution; the relation of the high school to the elementary school, to college, and to the world of industrial and commercial affairs; vocational education and vocational guidance; and student collateral activities.
- 39b. Seminary in Educational Administration. *Credit to be arranged.* Professor WHITNEY.
This course is a continuation of Course 39a. New students may be admitted upon the permission of the instructors.

MATHEMATICS

Courses 1, 2, 3, 4 (or equivalent courses), taken in order, furnish the preparation preliminary to further study in any field of pure or applied mathematics. Courses 1E, 2E, 3E, and 4E are equivalent to the courses prescribed for students in the Department of Engineering (see announcement of that Department).

Courses 1, 1E, 2, 2E, 2a, 3, 3E, 3a, 3b, 4, 4E, 4a, 4b, 15, 16, 51, and 52 are intended primarily for undergraduates; Courses 5, 7, 8, 9, 10, 13, 14, 19, 20, 27, 28, 33, 34, 53, and 54 are for undergraduates and graduates; other courses are primarily for graduates, though undergraduates of exceptional ability are admitted by special permission.

Students preparing to teach mathematics in high schools should take Courses 1, 2 (or 1E, 2E), 3, 4, 19, 20, and five or more hours of additional work, to be selected after conference with the head of the department. Such conference should be had not later than the beginning of the second year.

Students intending to specialize in Actuarial or Statistical Mathematics are advised to consult the instructor in charge early in their course and to examine carefully the program of studies under the course in Insurance and Statistics in the special bulletin of courses in Business Administration. The courses in Mathematics for students in actuarial or statistical lines of study should be taken in the following order: 1, 2, 3 (or 3E or 3a) and 51, 4 (or 4E or 4a) and 52, 13, 49, 61, and 53, 14, 50, 62, and 54, 55, and 56.

FIRST SEMESTER

- A. Geometry and Plane Trigonometry. *Four hours.* Mr. FORSYTH.
No credit for graduation is counted for this course until course B has been satisfactorily completed. These courses are intended for those only who present *one* unit of geometry and *one* unit of algebra.
 1. Plane Trigonometry and Algebra. *Four hours.* Eleven sections. Professors MARKLEY, HALL, GLOVER, and FORD, Assistant Professors BRADSHAW and KARPINSKI, Mr. MILLER, and Mr. FORSYTH.
Students who offer Plane Trigonometry either for admission or advanced credit should elect Course 1E, as follows:
 - 1E. Algebra and Analytic Geometry. *Four hours.* Three sections. Professor FORD, Assistant Professor BRADSHAW, and Mr. MILLER.
 2. Plane Analytic Geometry. *Four hours.* Two sections. Mr. MILLER and Mr. FORSYTH.
 3. Calculus (I). *Four hours.* Professor BEMAN.
Courses 3 and 4 give considerable attention to the historical and pedagogical aspects of the subject, and are required for Courses 19 and 20.
 - 3E. Calculus (I). *Five hours.* Professor MARKLEY.
 - 3a. Calculus, Shorter Course (I). *Three hours.* Assistant Professor BRADSHAW.
Courses 3a and 4a are intended for those who, while not wishing to specialize in Mathematics, desire as a part of a liberal education an acquaintance with the leading ideas of the Infinitesimal Calculus and its important applications.
 - 4b. Calculus (II). *Four hours.* Assistant Professor KARPINSKI.
 5. Solid Analytic Geometry. *Two hours.* Professor BEMAN.
 7. Projective Geometry (I). *Three hours.* Assistant Professor BRADSHAW.
 9. Differential Equations. *Three hours.* Professor BEMAN.
 11. Theory of Functions. *Three hours.* Professor MARKLEY.
 13. Higher Algebra (I). *Three hours.* Professor GLOVER.
 17. Theory of the Potential. *Three hours.* Professor ZIWET.
 19. Teachers' Seminary. Algebra. *Two hours.* Professor BEMAN.
Courses 19 and 20 are open to those who have completed Courses 1, 2 (or 1E, 2E), 3 and 4.

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21. Advanced Differential and Integral Calculus (I). *Two hours.* Professor BEMAN.
25. Differential Geometry (I). *Two hours.* Professor HALL.
27. Theory of Numbers (I). *Two hours.* Mr. ESCOTT.
29. Harmonic Analysis (I). *Two hours.* Professor FORD.
31. Theory of Functions, including the Theory of Elliptic Functions. Advanced Course (I). *Two hours.* Professor MARKLEY.
33. Advanced Mechanics (I). *Three hours.* Professor FIELD.
35. Elementary Theory of Differential Equations. A lecture course with references to available literature on the subject. Particular attention will be given to the ideas of Lie. *Three hours.* Professor HALL.
37. Mathematical Theory of Elasticity (I). *Two hours.* Professor ZIWET.
41. Infinite Series and Products (I). *Two hours.* Professor FORD.
- [43. The Theory of Integral Equations. Professor FORD. Omitted in 1913-1914. To be given in 1914-1915.]
47. History of Mathematics (I). Lectures, discussions, and required readings. *Two hours.* Assistant Professor KARPINSKI. This course is especially planned to give prospective teachers of secondary mathematics a survey of the historical development of the elementary branches—arithmetic, algebra, geometry, trigonometry, and the beginnings of analytic geometry and the calculus—from early times to the present. Some attention will also be paid to an historical treatment of the methods of teaching the science. A reading knowledge of French or German is highly desirable.
49. Mathematical Theory of Statistics (I). *Two hours.* Mr. ESCOTT.
The subjects treated in this course are averages, graphical representation of statistics, frequency curves, correlation, smoothing of statistics; with applications to statistical problems in economics, biology, insurance, and physics.
A knowledge of calculus is necessary.
51. Introduction to the Mathematical Theory of Interest, Insurance, and Statistics (I). *Two hours.* Professor GLOVER.
The aim of this course is to explain and illustrate the application of mathematics to financial transactions, life insurance, and statistics, to such an extent as may be of interest and value to the general student.
It must be preceded by Courses 1 (or 1E) and 2 (or 2E).
53. Advanced Mathematical Theory of Interest and Life Contingencies (I). *Two hours.* Professor GLOVER.
Course 53 is open to those who have completed Courses 3 (or 3E, or 3a), 4 (or 4E, or 4a), and 52.
55. Seminary in Actuarial and Statistical Mathematics. *Credit to be arranged.* Professor GLOVER.

- [57. Curve Tracing. *Two hours.* Assistant Professor RUNNING. Omitted in 1913-1914.]
- 57a. Empirical Formulas and Graphical Methods (I). *Two hours.* Assistant Professor RUNNING.
61. Finite Differences and Difference Equations (I). *Two hours.* Professor GLOVER.
63. General Analysis (I). *Two hours.* Dr. HILDEBRANDT.
This course will take up the recent developments in the line of generalization, together with applications to the theory of linear integral equations and linear differential equations. It will be based on Moore: Introduction to General Analysis. Primarily for graduate students.

SECOND SEMESTER

- B. Algebra. *Four hours.* Mr. FORSYTH.
1. Plane Trigonometry and Algebra. *Four hours.* Two sections. Mr. MILLER and Mr. FORSYTH.
2. Plane Analytic Geometry. *Four hours.* Eleven sections. Professors MARKLEY, HALL, GLOVER, and FORD, Assistant Professors BRADSHAW and KARPINSKI, Mr. MILLER and Mr. FORSYTH.
- 2E. Analytic Geometry. *Four hours.* Three sections. Professor FORD, Assistant Professor BRADSHAW, and Mr. MILLER.
- 3b. Calculus (I). *Four hours.* Assistant Professor KARPINSKI.
4. Calculus (II). *Four hours.* Professor BEMAN.
- 4E. Calculus (II). *Five hours.* Professor MARKLEY.
- 4a. Calculus, Shorter Course (II). *Three hours.* Assistant Professor BRADSHAW.
8. Projective Geometry (II). *Three hours.* Assistant Professor BRADSHAW.
10. Quaternions. *Credit to be arranged.* Professor BEMAN.
12. Theory of Functions. *Three hours.* Professor MARKLEY.
14. Higher Algebra (II). *Three hours.* Professor GLOVER.
18. Higher Plane Curves. *Two hours.* Professor BEMAN.
20. Teachers' Seminary. Geometry. *Two hours.* Professor BEMAN.
22. Advanced Differential and Integral Calculus (II). *Two hours.* Professor BEMAN.
26. Differential Geometry (II). *Credit to be arranged.* Professor HALL.
28. Theory of Numbers (II). *Two hours.* Mr. ESCOTT.
30. Harmonic Analysis (II). *Two hours.* Professor FORD.
32. Theory of Functions. Advanced Course (II). *Two hours.* Professor MARKLEY.
34. Advanced Mechanics (II). *Three hours.* Professor FIELD.
36. Vector Analysis. *Three hours.* Professor ZIWET.
38. Mathematical Theory of Elasticity (II). *Two hours.* Professor ZIWET.
42. Infinite Series and Products (II). *Two hours.* Professor FORD.

- [44. The Theory of Integral Equations. Continuation of Course 43. Professor FORD. Omitted in 1913-1914. To be given in 1914-1915.]
- 48. History of Mathematics (II). *Two hours.* Assistant Professor KARPINSKI.
- 50. Mathematical Theory of Statistics (II). *Two hours.* Mr. ESCOTT.
- 52. Introduction to the Mathematical Theory of Interest, Insurance, and Statistics (II). *Two hours.* Professor GLOVER.
- 54. Advanced Mathematical Theory of Interest and Life Contingencies (II). *Two hours.* Professor GLOVER.
- 56. Seminary in Actuarial and Statistical Mathematics. *Credit to be arranged.* Professor GLOVER.
- 58. Empirical Formulas and Graphical Methods (II). *Two hours.* Assistant Professor RUNNING.
- 60. Theory of Twisted Curves and Surfaces (II). *Two hours.* Professor FIELD.
- 62. Finite Differences and Difference Equations (II). *Two hours.* Professor GLOVER.
- 64. General Analysis (II). *Two hours.* Dr. HILDEBRANDT.

ASTRONOMY

Courses 1, 2, 2a and 8 are intended to furnish a general knowledge of descriptive astronomy without entering far into its mathematical details. Courses 3, 5, 9, and 18 are beginning courses in the technical departments of Spherical and Practical Astronomy, Mathematical Astronomy, Astrophysics, and Solar Physics, respectively.

FIRST SEMESTER

- 1. Descriptive Astronomy. The Solar System. *Two hours.* Two sections. Professor CURTISS and Dr. MERRILL.
A descriptive course, including the fundamental principles of Astronomy, and a presentation of the leading facts respecting the sun, moon, planets and comets. Occasional lantern illustrations, with visits to the Observatory.
- 3. Practical Astronomy. *Two hours.* Dr. MERRILL.
The elements of Spherical Astronomy with practical applications. Theory of the sextant and transit and their use in the determination of time, latitude, longitude, and azimuth. The observational work at the Observatory in connection with this course will be varied to suit the needs of students from different departments.
- [4. Advanced Practical Astronomy. Recitations and observational work. *Two hours.* Professor HUSSEY.
Studies in Spherical Astronomy. Theory of the equatorial and its use in observational work. Reduction of measurements. Open to those who have had Course 3 or its equivalent. Omitted first semester of 1913-1914.]

5. Theoretical Astronomy. *Three hours.* Professor CURTISS.
The elements of Celestial Mechanics, and theory and practice in the determination of parabolic and elliptic orbits. This course presupposes a knowledge of integral calculus.
8. History of Astronomy. *Two hours.* Dr. MERRILL.
The History of Astronomy since the invention of the telescope, but treating especially of the development of the science during the past century. Open to those who have had Courses 1 and 2 or an equivalent.
11. Variable Stars. *Two hours.* Professor CURTISS.
Lectures at the University and observational studies of selected stars at the Observatory.
12. Spectroscopic Binaries. *Two hours.* Professor CURTISS.
Theory and practice in the determination of orbits from spectroscopic measurements of motion in the line of sight, and from photometric observations of variation in brightness. Course 9 is a prerequisite.
14. Advanced Mathematical Astronomy. Studies in continuation of Course 7 will be arranged for those qualified to take them. *Credit to be arranged.* Offered both semesters.
18. Solar Physics. *Two hours.* Dr. MERRILL.
A critical study of the various theories of the sun. Discussion of the methods and instruments used in solar research. Lectures and collateral reading. Observatory practice. Calculus and general physics are required.
21. Advanced Physical Astronomy. *Credit to be arranged.* Professor CURTISS and Dr. MERRILL.
Studies in continuation of Courses 9 and 18 will be arranged for those qualified to take them.

SECOND SEMESTER

2. Descriptive Astronomy. Stars and Nebulae. *Two hours.* Two sections. Professor HUSSEY and Dr. MERRILL.
A general descriptive course in Stellar and Nebular Astronomy. Occasional lantern illustrations. May be taken in continuation of Course 1, or independently, as desired.
- 2a. Elementary Practical Astronomy. *Two hours.* Observatory. Professor CURTISS.
Constellation studies and telescopic examinations of the heavenly bodies. Selected problems with the celestial globe and the equatorial telescope. Observational work at the Observatory. To be preceded by Course 1, or to be taken in connection with Course 2 or Course 3e.
- 3e. Practical and Geodetic Astronomy. *Two hours.* Dr. MERRILL.
The elements of Spherical and Geodetical Astronomy with practical applications. The theory of the determination of time, latitude, longitude, and azimuth.

4. Advanced Practical Astronomy. Observational work at the Observatory. *Two hours.* Professor HUSSEY.
Studies in Spherical Astronomy. Theory of the equatorial and its use in observational work Reduction of measurements. Open to those who have had Course 3 or its equivalent.
6. Method of Least Squares. *Two hours.* Dr. MERRILL.
Theory of the combination and adjustment of observational data according to the Method of Least Squares. Construction and discussion of empirical curves in the solution of experimental problems.
7. Advanced Theoretical Astronomy. *Two hours.* Professor HUSSEY.
Definitive determination of orbits. Theory of Interpolation and Mechanical Quadrature. Special Perturbations Open to those who have had Course 5.
9. Astrophysics. *Two hours.* Professor CURTISS.
Introductory Course. General treatment of methods and results, having reference to the interpretation of stellar phenomena. Practice in the measurement and reduction of spectrographic plates will form a part of the course. A general knowledge of physics, astronomy, and calculus is required.
12. Spectroscopic Binaries. *Two hours.* Professor CURTISS.
Continued from the first semester.
14. Advanced Mathematical Astronomy. See announcement for first semester. Professor HUSSEY.
21. Advanced Physical Astronomy. See announcement for first semester. Professor CURTISS and Dr. MERRILL.

PHYSICS

All lectures in Physics are given in the larger lecture room at the west end of the Physical Laboratory.

Laboratory work *twice a week*, means *two periods* of laboratory work a week, not simply two hours; credit, *two hours*. The fees for laboratory courses are based upon the *number of weekly periods* of two hours each, of laboratory work comprised in the course. Thus for a course requiring laboratory work *once a week*, the fee is \$1.00; for one requiring work *twice a week*, \$2.00; and so on.

Students entering without a preparatory course in high school physics will be allowed to enter Courses 1 and 2 only under the condition that they elect Courses 1*b* and 3*a* in addition to Course 1, and Courses 2*b* and 4*a* in addition to Course 2.

Students expecting to teach physics in high schools should take at least the following courses: 1, 1*a*, 3*a*, 2, 2*a*, 4*a*, 5, 7, 8.

FIRST SEMESTER

A. Courses Primarily for Undergraduates.

1. General Physics: Mechanics, Sound, and Heat. Lectures and recitations. *Four hours.* Professor RANDALL and assistants. Course 1 must be preceded or accompanied by a course in plane trigonometry.

Students who contemplate transferring their credits to the Department of Engineering will be required to offer Courses 1, 1a, and 3a as an equivalent of 1E.

Students who have not satisfied the entrance requirement in physics must elect Courses 1b and 3a in conjunction with Course 1.

- 1a. Physical Problems. *One hour.* This course should be elected in conjunction with Course 1. It is especially designed for students preparing to teach. Special attention is given to the solution of illustrative problems. Mr. SLEATOR.

- 1b. Elements of Physics. *One hour.* Mr. RICH.

This course must be elected in conjunction with Course 1 and is open only to students entering without preparatory physics. It forms an extension of Course 1, since one recitation a week is added by this course to the two regular recitations of Course 1. The additional hour allows a fuller discussion of the more difficult portions of the subject.

- 1E. Mechanics, Sound and Heat. *Five hours.* (For Engineering students only.) Lectures, recitations and laboratory work. Professor HENDERSON and assistants.

In this course at least half of the semester is devoted to elementary Mechanics; the remainder of the time, to Sound and Heat, all with experimental demonstrations. All members of the class have one period a week in the laboratory.

For this course a knowledge of plane trigonometry is indispensable. The course is open to those only who have satisfied the entrance requirement in physics.

3. Physical Measurements. This course comprises elementary laboratory exercises in the determination of fundamental physical quantities. It is intended to supplement the instruction in Course 1. It may be elected as:

- 3a. *One hour.* Only in conjunction with Course 1. Mr. _____

- 3b. *Two hours.* This course may accompany or follow Course 1. Mr. _____

B. For Graduates and Undergraduates.

5. Electrical Measurements. *Four hours.* Lectures and recitations. Professor SMITH.

This course includes all modern methods of measuring resistance, current, and electromotive force.

Course 5 must be preceded by Courses 1, 2, and either 3a and 4a, or 3b or 4b; or by 1E and 2E. A knowledge of calculus is also required.

7. Advanced Physics. *Four hours.* Professor GUTHE.
This course is intended primarily for students preparing themselves to teach. Courses 1 and 2 are prerequisites and a knowledge of calculus is required
9. Direct Current Machinery. *Two hours.* Lectures and Laboratory work. Assistant Professor WILLIAMS.
This course must be preceded by Courses 1, 2, and at least two hours of elementary laboratory work.
11. Laboratory Work in Heat. *Two hours.* Professor RANDALL.
This course comprises determinations of specific heat of solids and liquids; heat of fusion and of vaporization, the coefficient of expansion of solids, liquids, and gases; also experiments on the constants of gases and vapors, such as the specific heat of expansion of solids, liquids, and gases; also experiments on determination of the mechanical equivalent of heat by electrical methods.
15. Electrochemical Physics. *Two hours.* Lectures and laboratory work. Professor HENDERSON.
This course offers a study, from the view point of physics, of the fundamental principles of electrochemistry. It is designed (a) to meet the needs of those preparing to teach physics and chemistry, (b) to furnish a basis for the application of electrochemical principles to practical problems in chemistry and electricity, and (c) to prepare for research in electrochemical physics.
Course 15 must be preceded by Courses 1, 2, and at least two hours of elementary laboratory work.

C. Primarily for Graduates.

17. Theoretical Mechanics. Assistant Professor FIELD.
Geometry of Motion; Kinematics of a particle and of a rigid body; Statics; Kinetics of a particle and of a rigid body; the problem of the top; relative motion; Lagrange's equations, general principles of mechanics.—*Three hours a week, throughout the year, hours to be arranged.*
19. Sound and Other Oscillatory Phenomena. *Four hours.* Lectures, laboratory work and reading. Mr. SLEATOR.
This course includes the fundamental phenomena of sound: differential equations of motion for systems having one and two degrees of freedom; characteristic phenomena of free, forced, and damped vibrations; resonance; applications of Fourier's series to specific cases; theory of electric oscillations; stationary electric waves; electric resonance and tuning. Course 19 must be preceded by Courses 1 and 2 and at least two hours elementary laboratory work. A knowledge of calculus is required.

23. Theory of Heat: Preston. *Two hours.* Professor RANDALL.
Course 23 must be preceded by Course 2 or 2E.
25. Thermodynamics. Lectures and recitations. *Two hours.* Dr. COLBY.
This course covers the principles of modern thermodynamics, as developed by Gibbs, Planck, and Duhem. Special emphasis is placed on the application of these principles to numerous problems in physics and chemistry.
27. Theory of Electricity and Magnetism. *Two hours.* Professor GUTHE.
This course should be preceded by a course in electrical measurements; a knowledge of calculus is also required.
29. Special Problems.
Research work on special problems under the direction of some member of the teaching staff.—*Credit to be arranged.*
35. Physical Colloquium. Reports upon important articles in current physical literature, with analysis, and discussion of results. Current reports upon problems in original research. *Two hours.* Professor GUTHE.
All instructors and assistants in the department take part in the Physical Colloquium. While intended primarily for graduate students, it is also open to undergraduates doing advanced work.
37. German Reading. *Two hours.* Assistant Professor LEE.
In this course the subject of physics is studied in German to acquaint the student with the technical terms used in modern German Physics. This course may be taken only by such students as convince the instructor of their satisfactory preparation.

SECOND SEMESTER

- A. *Courses Primarily for Undergraduates.*
2. General Physics. *Four hours.* Magnetism, Electricity and Light. Lectures and recitations. Professor RANDALL and assistants.
This course must be preceded by Course 1.
Students who contemplate transferring their credits to the Department of Engineering will be required to offer Courses 2, 2a, and 4a as an equivalent of 2E.
- 2a. Physical Problems. Continuation of Course 1a. *One hour.* Mr. SLEATOR.
- 2b. Elements of Physics. *One hour.* Mr. RICH.
This course is a continuation of Course 1b and is open only to students entering without preparatory physics. It forms an extension of Course 2. It must be taken in conjunction with Course 2 by the class of students mentioned.

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2E. Magnetism, Electricity and Light. *Five hours.* Lectures, recitations, and laboratory work. (For Engineering students.) Continuation of Course 1E. Professor HENDERSON, and assistants.

4. Physical Laboratory Work. This course may be elected either as

4a. *One hour*, only in conjunction with Course 2; or

4b. *Two hours.* Mr. _____.

This course may accompany or follow Course 1 or 2.

B. For Graduates and Undergraduates.

6. Electrical Measurements. *Four hours.* Lectures, recitations and laboratory work. Professor SMITH.

This course is a continuation of Course 5 and includes measurements of capacity, inductance and magnetic quantities.

8. Advanced Physics. *Four hours.* Continuation of Course 7. Professor GUTHE.

10. Alternating Currents. *Two hours.* Lectures and laboratory work. Assistant Professor WILLIAMS.

12. High Temperature Measurements. *One hour.* Professor RANDALL.

14. Electron Theory and Radioactivity. *Two hours.* Lectures and recitations. Professor GUTHE.

This course must be preceded by Courses 1 and 2.

16. Electrochemical Physics. *Two hours.* Professor HENDERSON. This course must be preceded by Course 15, or an equivalent course in Electrochemistry.

C. Courses Primarily for Graduates.

18. Theoretical Mechanics. Assistant Professor FIELD.

[20. Theory of Light: Preston. Recitations and laboratory work. *Four hours.* Professor REED. Not given in 1913-1914.]

24. Radiation. *Two hours.* Professor RANDALL.

26. Thermodynamics. Dr. COLBY. Continuation of Course 25.

28. Electricity and Magnetism. Continuation of Course 27. *Two hours.* Professor GUTHE.

30. Special Problems.

34. Seminary. *Two hours.* Professor GUTHE.

36. Colloquium. Professor GUTHE.

38. German Reading. *Two hours.* Assistant Professor LEE. This course is a continuation of Course 37.

CHEMISTRY

Students who expect to specialize in Chemistry are urged to elect in their first year of study, English, mathematics, and German. A reading knowledge of German and French is almost indispensable to advanced work in chemistry. Mathematics is necessary for those who expect to do advanced work in theoretical or technical chemistry. A year's work in university physics should be taken by these who elect work in advance of Course 3.

The courses numbered 1 to 10 give work upon the foundation of chemistry, in its several divisions. A sufficient number of these courses must be completed before entering upon the advanced studies of the science, or its special application to the industries and professions. It is stated for each course what other courses must precede it. Of the more advanced studies, Courses 13 to 26 are in General, Inorganic, and Physical Chemistry; Courses 27 to 40 in Analytical, Technical, and Applied Chemistry; Courses 42 to 51 in Organic Chemistry.

FIRST SEMESTER

Foundation Courses in Chemistry:

1. General and Inorganic Chemistry. Lectures and recitations.
Two hours. Professor BIGELOW.

Course 1 must be accompanied by Course 1a.

- 1a. General and Inorganic Chemistry. Laboratory and discussions.
Two hours. Dr. HARRIS, Mr. JOHNSON and Mr. HOCKER.

Those electing Course 1 and 1a are expected to elect Courses 2 and 2a the following semester, as they form one complete whole and should properly be considered as one course extending through the year. They must precede all other courses in chemistry.

- A. General and Inorganic Chemistry. Lectures, recitations, and laboratory. *Six hours.* Assistant Professor LICHTY.

Course A is required of all first year students in the Departments of Dentistry and Pharmacy. Others may elect the course only by special permission.

- 2E. General and Inorganic Chemistry. Lectures, recitations, and laboratory. *Four hours.* Assistant Professor SMEATON and Mr. _____.

Course 2E is required of all first year students in the Department of Engineering who have presented entrance chemistry. Others may elect the course only by special permission.

- 2b. General and Inorganic Chemistry. Lectures, recitations, and laboratory. *Four hours.* Assistant Professor HALE.

This course is for students who have had chemistry, but not the full equivalent of Courses 1, 1a, 2 and 2a. It may be

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elected only after consultation with the instructor. An examination will be held within the first four weeks and those considered inadequately prepared will be transferred to Course 1.

3. Qualitative Analysis. Recitations and laboratory. *Seven hours.*
Mr. MCALPINE.

Course 3 must be preceded by 2 or 2b.

- 3a. Qualitative Analysis. Recitations and laboratory. *Four hours.*
Assistant Professor WILLARD, Mr. COLE, Mr. MCALPINE, and Dr. LAIRD.

Course 3a must be followed by 3b before higher courses in Analytical Chemistry are taken. Course 3a must be preceded by 2 or 2b.

- 3b. Qualitative Analysis. Recitation and laboratory. *Four hours.*
Mr. CARNEY.

Course 3b must be preceded by 3a.

5. Quantitative Analysis. Beginning Course. Recitations and laboratory. *Five hours.* Professor CAMPBELL, Assistant Professor WILLARD and Mr. GREATHOUSE.

Course 5 must be preceded by Course 3 or 3b.

7. Organic Chemistry. Lectures and recitations. *Five hours.*
Professor GOMBERG and Assistant Professor CONE.

Course 7 must be preceded by Course 3 or 3b

Those electing Course 7 should elect Course 7a in the following semester, as they should properly be considered as one course extending through the year. These courses are taken by the students in the department of Chemical Engineering, and are intended for those who desire a fuller knowledge of the fundamental principles of organic chemistry than can be obtained in the more elementary Courses 10 and 11. Undergraduate students specializing in chemistry and all graduate students who elect organic chemistry as either the major or a minor subject should arrange to take Courses 7 and 7a.

11. Organic Chemistry. *Three hours.* Lectures and recitations.
Assistant Professor CONE.

Course 11 should, if possible, be preceded by Course 3a or 3b. This course is required of second year students in the Departments of Dentistry and of Pharmacy, and covers briefly the elementary principles of organic chemistry. Others may elect it by special permission. If elected to fulfill the requirements of the Department of Medicine and Surgery, or of the Homeopathic Medical College, it must be accompanied or followed by laboratory work, two hours or more in Courses 42.

12. Chemistry of the Household. *Three hours.* Lectures and recitations. Dr. HUBBARD.

A study of foods and their dietetic value. Simple tests for identity, purity, and strength, including starches, sugars, fats,

flavoring extracts, spices, beverages, preservatives and dairy products with the chemical changes that occur in baking, jelly making, cleansing, etc.

Course 12 must be preceded by Courses 2 and 2a or 2b.

General and Physical Chemistry:

13. Physical-Chemical Measurements. *Three to eight hours.* Laboratory work. Dr. BARTELL.

The eight hours which are required for the completion of all the work in Course 13 may be divided between two semesters. The course must be preceded or accompanied by Courses 5 and 8.

15. History of Chemistry and Development of Chemical Theory from early times to Dalton. *Two hours.* Lectures and seminary. Assistant Professor SMEATON.

16. Laboratory Research in Inorganic Chemistry. *Credit to be arranged.* Professor BIGELOW, Assistant Professor LICHTY.

17. Laboratory Research in Organic Chemistry. *Credit to be arranged.* Assistant Professor HALE.

18. Laboratory Research in Physical Chemistry. *Credit to be arranged.* Professor BIGELOW, Assistant Professor SMEATON.

Courses 15, 16, 17, 18, and 21 are intended for advanced students. They are open only to persons who receive special permission from the instructor. Students electing these courses must be able to read German and French, and must have a knowledge of inorganic, organic, and analytical chemistry.

19. Seminary in Special Topics. Conferences and reading. *One to three hours.* Professor BIGELOW.

Course 19 must be preceded by Courses 8 and 13. Permission must be obtained from the instructor to elect this course.

20. German Reading. *Two hours.* Assistant Professor LEE. In this course the subject of chemistry is studied in German to acquaint the student with the chemical terms used in that language.

This course may be taken only by such students as convince the instructor of their satisfactory preparation. It is continued in the second semester as Course 20a.

21. Research in Physical Chemistry. *Credit to be arranged.* Dr. BARTELL.

The course is open only to students who have had the important courses in physics and chemistry.

22. Spectroscopic Analysis and Use of the Spectroscope. One lecture and one laboratory period a week. *Two hours.* Assistant Professor LICHTY.

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23. Advanced Theoretical and Physical Chemistry. *Two hours.* Dr. BARTELL.
This course is a continuation of Course 8. Thermochemistry, electrochemistry, chemistry of colloids, the phase rule and other special topics will be taken up in more detail than was possible in Course 8.
- [26b. Stereochemistry, including a general study of isomerism. Lectures. *Two hours.* Assistant Professor HALE.
Course 26b must be preceded by Course 7 or 10. Omitted in 1913-1914.]
- 26a. The Heterocyclic Derivatives in Organic Chemistry. *Two hours.* Assistant Professor HALE.
Course 26 must be preceded by Course 7 or 10.

Analytical and Applied Chemistry:

28. Advanced Quantitative Analysis. *Four or five hours.* Laboratory work. Assistant Professor WILLARD.
Course 28 is open to those who have taken Course 5, and Course 2 in Physics.
31. Independent Work in Mineral Analysis. Laboratory work. *Five hours.* Professor CAMPBELL and Assistant Professor WILLARD.
Course 31 must be preceded by Course 28. It is desirable that this course be preceded by Course 27 and also by Course 2 in Mineralogy.
32. Technical Examination of Gold and Silver Ores by the Fire Assay. Laboratory work, with lectures and reading. *Two hours.* Mr. BADGER.
Course 32 must be preceded or accompanied by Course 28. Course 2 in Mineralogy is recommended.
33. Chemical Technology. A study of inorganic industrial chemistry. The course is split into three groups, each of which may be elected separately.
- a. Fuels and their Utilization. Water Purification. *Two hours.* Assistant Professor WARE.
 - b. Clay Products. Cement and Glass—a Study of the Silicate Industries. *Two hours.* Assistant Professor WARE.
 - c. Salts, Acids, and Alkalies, including some Electrolytic and Electrothermal Processes. *Two hours.* Professor WHITE.
- Course 33 must be preceded by Course 3 or 3b and by Course 1 in Physics. Course 8 is recommended.
34. Chemical Reading. Reading and seminary work. *One hour.* Professor CAMPBELL.
Course 34 requires special permission.
35. Technical Gas Analysis, including Calorimetry and Photometry. Lectures and laboratory. *Two hours.* Mr. BADGER and Mr. RUE.
Course 35 must be preceded by Course 5.

36. Original Investigation in Qualitative Analysis. Laboratory work. *Credit to be arranged.* Assistant Professor WILLARD, Mr. CARNEY and Mr. COLE.
Course 36 must be preceded by Course 5, and requires special permission.
37. Original Investigation in Analytical Chemistry. Laboratory work. *Credit to be arranged.* Professor CAMPBELL and Assistant Professor WARE, Mr. A. E. WHITE, Mr. BADGER and Mr. RUE.
Course 37 is open only to those who have special permission.
39. Chemical Technology. Laboratory Course in Special Problems. Discussions once a week at hour to be arranged. *Credit three to eight hours.* Professors CAMPBELL and WHITE, Assistant Professor WARE, Mr. A. E. WHITE, Mr. BADGER and Mr. RUE.
The purpose of this course is to train the student in methods of independent study. Each student is, after consultation, assigned a subject connected with some manufacturing industry which he is to study intensively both in the library and laboratory. Wide latitude is allowed in the choice of a subject and the student is, so far as possible, urged to select that which interests him most.
Special permission must be obtained to elect this course, which must be preceded by Courses 28, 33, and such additional courses as the subject may require. A reading knowledge of French, or preferably German, is essential.
- 39a. Chemical Technology. Seminary. Discussion of technical problems. *Two hours.* Professor WHITE.

Organic Chemistry:

42. Organic Chemistry. *Two to five hours.* Laboratory work. Professor GOMBERG and Assistant Professor CONE.
Course 42 must be preceded or accompanied by Course 10 or 11.
43. Advanced Organic Chemistry and Ultimate Analysis. Laboratory work and reading. Continuation of Course 42. *Three, four, or five hours.* Professor GOMBERG and Assistant Professor CONE.
- 44a. Food and Drug Analysis. *Five hours.* Laboratory work with reference reading. Dr. HUBBARD.
Course 44a must be preceded by Courses 5 and 7.
46. Seminary in Special Topics. Lectures and reading. *Two hours.* Professor GOMBERG.
Course 46 must be preceded by Courses 7 and 7a, and requires a reading knowledge of German.
49. Research in Organic Chemistry. Laboratory work. *Credit to be arranged.* Professor GOMBERG and Assistant Professor CONE.
Course 49 must be preceded by Courses 7 and 42, and requires special permission.

SECOND SEMESTER

Foundation Courses in Chemistry:

- 1b. General and Inorganic Chemistry. Lectures and Laboratory. *Four hours.* Assistant Professor LIGHTY.

This course offers an opportunity for those entering the University at the opening of the second semester to commence the study of chemistry, but no student will be admitted who might have elected 1 and 1a. Special permission must be obtained from the instructor in order to elect this course.

- 2 and 2a. General and Inorganic Chemistry. Continuation of Courses 1 and 1a, the hours and credits being the same in both semesters. Assistant Professor HAILE.

- 2E. General and Inorganic Chemistry. Same as 2E the first semester.

3. Qualitative Analysis. Recitations and laboratory. *Seven hours.* Mr. MCALPINE.

This course is the same as Course 3, given in the first semester.

- 3a. Qualitative Analysis. Recitations and laboratory. *Four hours.* Mr. CARNEY.

This course is the same as Course 3a, given in the first semester.

- 3b. Qualitative Analysis. Recitations and laboratory. *Four hours.* Mr. CARNEY.

Course 3b must be preceded by 3a.

5. Quantative Analysis Beginning Course. Recitations and laboratory. *Five hours.* Professor CAMPBELL, Assistant Professor WILLARD, and Mr. GREATHOUSE.

Course 5 must be preceded by Course 3 or 3b.

6. Inorganic Preparations. *Three to seven hours.* Assistant Professor LICHTY.

Students electing this course must have completed Course 3a. Course 6 involves the study of chemical reactions and principles as they apply to the preparation of the commonly used chemicals; a study of the properties of these chemicals, the conditions under which they remain in solution, if they are soluble, and their uses in chemical operations and as illustrative materials in teaching.

- 7a. Organic Chemistry. Continuation of Course 7. *Four hours.* Lectures, recitations and laboratory. Professor GOMBERG and Assistant Professor CONE.

8. Elementary Theoretical and Physical Chemistry. Lectures. *Four hours.* Professor BIGELOW.

This course must be preceded by Course 3 or 3b. It may be elected by students planning to take the seven year Combined Literary-Medical Course, on the completion of Course 3a. Physics 2 is strongly recommended.

9. Inorganic Chemistry. Descriptive and experimental lectures, including selected topics. Continuation of Courses 1 and 2. *Three hours.* Assistant Professor LICHTY.
Course 9 must be preceded or accompanied by Course 3 or 3a.
10. Organic Chemistry. *Four hours.* Lectures and recitations. Professor GOMBERG.
Course 10 should be preceded by Courses 3a or 3b.
This Course is intended for students preparing to enter the Department of Medicine and Surgery or the Homeopathic Medical College. (Compare Course 11.) It may also be taken by all those who desire to obtain a more elementary knowledge of the principles of organic chemistry than is covered by Courses 7 and 7a.

General and Physical Chemistry:

13. Physical-Chemical Measurements. *Three to eight hours.* Laboratory work. Assistant Professor LIND.
The eight hours which are required for the completion of all the work in Course 13 may be divided between two semesters. The course must be preceded or accompanied by Courses 5 and 8.
14. Electrochemistry. Lectures. *Two hours.* Dr. BARTELL.
The fundamental principles of the subject and consideration of instances of their application in analytical chemistry and in industrial processes.
Course 14 must be preceded by Course 8. Course 5 in Physics is recommended.
- 15a. History of Chemistry and Development of Chemical Theory from Dalton to the present. *Two hours.* Lectures and seminary. Assistant Professor SMEATON.
16. Laboratory Research in Inorganic Chemistry. *Credit to be arranged.* Professor BIGELOW, Assistant Professor LICHTY.
17. Laboratory Research in Organic Chemistry. *Credit to be arranged.* Assistant Professor HALE.
18. Laboratory Research in Physical Chemistry. *Credit to be arranged.* Professor BIGELOW and Assistant Professor SMEATON.
Courses 15a, 16, 17, 18, and 21 are intended for advanced students. They are open to persons who receive special permission from the instructor. Students electing these courses must be able to read German and French, and must have a knowledge of inorganic, organic and analytical chemistry.
19. Seminary in Special Topics. Conferences and reading. *One to three hours.* Professor BIGELOW.
Course 19 must be preceded by Courses 8 and 13. Permission must be obtained from the instructor to elect this course.

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- 20a. German Reading. Continuation of Course 20, the hours and credits being the same in both semesters. Assistant Professor LEE.

This course is intended for advanced students in chemistry, and may be taken only by such as convince the instructor of their satisfactory preparation.

This course may be elected through four semesters. The matter read is different each semester.

21. Research in Physical Chemistry. *Credit to be arranged.* Dr. BARTELL.

The course is open to students who have had the important courses in physics and chemistry.

24. Theory and Practice of Exact Measurements, with laboratory practice in glass blowing, calibration, and construction of apparatus. One lecture and one or two laboratory periods. *Two or three hours.* Dr. BARTELL.

Special permission must be obtained from the instructor in order to elect this course.

25. Thermodynamics. Applied to Chemistry. *One hour.* Dr. HARRIS.

Analytical and Applied Chemistry:

27. Chemistry of the Rare Elements. *Four hours.* Recitations, lectures, and laboratory work. Mr. CARNEY.

Course 27 must be preceded by Course 3 or 3b.

This course includes a study of the occurrence, uses, reactions, and the qualitative detection, both in artificial mixtures and in minerals, of the rare elements.

28. Advanced Quantitative Analysis. *Four or five hours.* Laboratory work. Assistant Professor WILLARD.

Course 28 is open to those who have taken Course 5, and Course 2 in Physics.

31. Independent Work in Mineral Analysis. Laboratory work. Five hours. Professor CAMPBELL and Assistant Professor WILLARD.

Course 31 must be preceded by Course 28. It is desirable that this course be preceded by Course 27 and also by Course 2 in Mineralogy.

33. Chemical Technology. A study of inorganic industrial chemistry. The course is split into two groups, each of which may be elected separately.

a. Fuels and their Utilization. Water Purification. *Two hours.* Assistant Professor WARE.

b. Clay Products. Cement and Glass—a Study of the Silicate Industries. *Two hours.* Assistant Professor WARE.

34. Chemical Reading. Reading and seminary work. *One hour.*
Professor CAMPBELL.
Course 34 requires special permission.
35. Technical Gas Analysis, including Calorimetry and Photometry.
Professor WHITE, Mr. BADGER, and Mr. RUE.
Course 35 must be preceded by Course 5.
36. Original Investigation in Qualitative Analysis. Laboratory work. *Credit to be arranged.* Assistant Professor WILLARD, Mr. CARNEY, and Mr. COLE.
Course 36 must be preceded by Course 5, and requires special permission.
37. Original Investigation in Analytical Chemistry. Laboratory work. *Credit to be arranged.* Professor CAMPBELL and Assistant Professor WILLARD.
Course 37 is open only to those who have special permission.
38. Chemical Technology. The industrial chemistry of organic compounds. Among the subjects treated are: starch, glucose, and sugar; fermentation and distillation; fats, oils, and soaps; bleaching and dyeing; tanning; paper manufacture. Lectures and assigned reading. *Four hours.* Professor WHITE.
Course 38 must be preceded by Courses 7 and 33a or 33c.
39. Chemical Technology. Laboratory work. *Three to eight hours.* Professors CAMPBELL and WHITE, Assistant Professor WARE and WHITE, Mr. BADGER and Mr. RUE.
Special permission must be obtained to elect this course, which must be preceded by Courses 28, 33, and such additional courses as the subject may require. A reading knowledge of French, or preferably German, is essential.
The purpose of this course is to train the student in methods of independent study. Each student is, after consultation, assigned a subject connected with some manufacturing industry which he is to study intensively both in the library and laboratory. Wide latitude is allowed in the choice of a subject and the student is, so far as possible, urged to select that which interests him most.

Organic Chemistry:

42. Organic Chemistry. *Two to five hours.* Laboratory work. Professor GOMBERG and Assistant Professor CONE.
Course 42 must be preceded or accompanied by Course 10 or 11.
43. Advanced Organic Chemistry and Ultimate Analysis. Laboratory work and reading. Continuation of Course 42. *Three, four, or five hours.* Professor GOMBERG and Assistant Professor CONE.
44. The Chemistry of Alkaloids. *Four hours.* Lectures and Laboratory. Dr. HUBBARD.
Course 44 must be preceded by Courses 5 and 7.

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- 44a. Food and Drug Analysis. *Five hours.* Laboratory work with reference reading. Dr. HUBBARD.
Course 44a must be preceded by Courses 5 and 7.
45. The Chemistry of Organic Dyes. *Two hours.* Assistant Professor CONE.
This course is designed for advanced students and requires special permission.
49. Research in Organic Chemistry. Laboratory work. *Credit to be arranged.* Professor GOMBERG and Assistant Professor CONE.
Course 49 must be preceded by Courses 7 and 42, and requires special permission.

METALLURGY

FIRST SEMESTER

1. Manufacture and Properties of Iron and Steel. Lectures and recitations. *Two hours.* Assistant Professor WHITE.
Course 1 must be preceded by Course 3 or 3a in Chemistry and Course 1 in Physics.
8. Metallography. Laboratory course on the microscopic structure of metals and alloys as related to their physical and chemical properties. *Two hours.* Assistant Professor WHITE.
This course must be preceded or accompanied by Course 1.

SECOND SEMESTER

1. Manufacture and Properties of Iron and Steel. Lectures and recitations. *Two hours.* One recitation at an hour to be arranged. Assistant Professor WHITE.
Course 1 must be preceded by Course 3 or 3a in Chemistry, and Course 1 in Physics.
8. Metallography. Laboratory course on the microscopic structure of metals and alloys as related to their physical and chemical properties. *Two hours.* Assistant Professor WHITE.
This course must be preceded or accompanied by Course 1.

For other courses in Metallurgy see the Engineering Announcement under Chemical Engineering.

MINERALOGY AND PETROGRAPHY

Courses 1, 4, 5, and 9 are designed to meet the needs of students of Civil Engineering, Forestry, and Pharmacy, teachers of the sciences in secondary schools, and others who desire a knowledge of the more common minerals and rocks, as well as the methods employed in their determination. Courses 2, 5, 9, 12, and 14 are especially adapted to students of Geology or Chemical Engineering, and others who desire a more comprehensive knowledge of the subject. For advanced students in Geology Courses 2, 5, 6a, 9, 10, and 11 are

strongly recommended. Students pursuing advanced work in light in the department of Physics are advised to take Courses 2, 3, and 6. Aside from the more general courses, students specializing in Mineralogy are required to take Courses 3, 6, 7, 8, 10, 11, 12, 13, 14, and 15. A fee of \$1.00 for each hour credit given will be charged for all courses involving laboratory work. All courses are given in the Mineralogical Laboratory in the basement of Tappan Hall.

FIRST SEMESTER

1. Elements of Mineralogy. Lectures and laboratory work. *Two hours.* Professor KRAUS, Assistant Professor HUNT, Mr. CLARK, and assistants.

This course includes the elements of crystallography, physical and chemical properties, occurrence, uses, and determination of the more common minerals. For this course a knowledge of elementary inorganic chemistry is necessary.

2. General Mineralogy. Lectures and laboratory work. *Five hours.* Professor KRAUS, Assistant Professor HUNT, and assistants.

Students who have successfully completed Course 1 may elect this course as Course 2a and receive *three hours* credit.

Principles of crystallography, physical and chemical properties, origin, formation, decomposition, distribution, uses, and determination of the more important minerals. Prerequisites, Chemistry 2 and 3.

3. Crystal Measurements. Measurement, calculation, and projection of crystals. Lectures and laboratory work. *Credit to be arranged.* Assistant Professor HUNT and Mr. CLARK.

This course is given both semesters and may be pursued for either one or two semesters. Prerequisite, Course 2.

4. Determinative Mineralogy. Laboratory work. *Two hours.* Assistant Professor HUNT.

Intended for students who have completed Course 1 or 2 and wish to become more proficient in the determination of minerals by means of their physical characters.

8. Research Work. Laboratory work. *Credit to be arranged.* Professor KRAUS, Assistant Professor HUNT, and Mr. CLARK.

For students, who are properly qualified, opportunity is given for original research along the lines of crystallographic measurements, chemical and physical crystallography, the formation and origin of minerals, blowpipe methods, and petrography.

9. Lithology. Lectures and laboratory work. *Two hours.* Mr. CLARK.

The lectures include, aside from a review of the rock-forming minerals, a discussion of the origin, modes of occurrence, alterations, methods of determination and uses of the more important rocks. In the laboratory the student is required to

determine by means of the macro-physical properties a large number of rock specimens. Field excursions will also be made in order to acquire facility in the rapid determination of rocks in the field. Prerequisites, Mineralogy 1 and Geology 1.

10. Petrography. Lectures and laboratory work. *Three, four, or five hours.* Mr. CLARK.

After reviewing the optical characters and methods of investigation of crystals, the various properties of the important rock minerals are discussed in detail. The mineralogical and chemical composition, texture, genesis, forms of occurrence, and metamorphism of rocks are then studied. The laboratory work is devoted to the systematic study of rock minerals and rocks with the aid of the polarizing microscope. Prerequisites, Mineralogy 2 or 1 and 4, 6 or 6a, and 9.

12. Quantitative Blowpipe Methods. Reading and laboratory work. *Two hours.* Assistant Professor HUNT.

Practice in assaying by blowpipe methods of various kinds of ores, especially those of gold, silver, copper, and lead. Prerequisite, Course 5.

13. Special Petrographic Methods. Assigned readings and laboratory work. *Two hours.* Mr. CLARK.

This course includes (a) determination by micro-chemical tests of rock-forming minerals, which are otherwise difficult of differentiation; (b) determination of the indices of refraction and other optical properties of mineral fragments; and (c) microscopical investigation of sands, clays, and so forth.

15. Advanced Qualitative Blowpipe Analysis. Reading and laboratory work. *Credit to be arranged.* Assistant Professor HUNT.

This course involves the application of blowpipe and other chemical methods in determining the less common minerals, and those containing some of the rare elements. Prerequisites, Mineralogy 5 and Chemistry 3 or 3a and 3b.

SECOND SEMESTER

1. Elements of Mineralogy. Lectures and laboratory work. *Two hours.* Professor KRAUS, Assistant Professor HUNT, Mr. CLARK, and assistants.

This course includes the elements of crystallography, physical and chemical properties, occurrence, uses, and determination of the more common minerals. For this course a knowledge of elementary inorganic chemistry is necessary.

3. Crystal Measurements. Measurement, calculation, and projection of crystals. Lectures and laboratory work. *Credit to be arranged.* Assistant Professor HUNT and Mr. CLARK.

This course is given both semesters and may be pursued for either one or two semesters. Prerequisite, Course 2.

4. **Determinative Mineralogy.** Laboratory work. *Two hours.* Assistant Professor HUNT.
Intended for students who have completed Course 1 or 2 and wish to become more proficient in the determination of minerals by means of their physical characters.
5. **Qualitative Blowpipe Methods.** Lectures and laboratory. *Two hours.* Assistant Professor HUNT.
This course involves the use of blowpipe reactions upon charcoal and plaster tablets, as well as other chemical methods useful in the determination of minerals. Prerequisites, Course 2, or Courses 1 and 4. Since only a limited number can be accommodated in this course, students are advised to consult the instructor as early as possible.
6. **Physical Crystallography.** Lectures and laboratory work. *Four hours.* Professor KRAUS, Assistant Professor HUNT, and Mr. CLARK.
This course involves a critical study of the various properties of crystals, including the use of the polarizing microscope and other crystallographic-optical instruments. Must be preceded by Course 2 and, if possible, by Course 3.
Students desiring to study only the optical properties of crystals may elect this course as 6a and receive *three hours credit*.
Of Courses 6 and 14, the one will be given which is desired by the greater number of students.
7. **Current Literature of Mineralogy.** *One or two hours.* Assistant Professor HUNT and Mr. CLARK.
This course consists of discussions, translations, and abstracts of important current literature.
8. **Research Work.** Laboratory work. *Credit to be arranged.* Professor KRAUS, Assistant Professor HUNT, and Mr. CLARK.
For students, who are properly qualified, opportunity is given for original research along the lines of crystallographic measurements, chemical and physical crystallography, the formation and origin of minerals, blowpipe methods, and petrography.
9. **Lithology.** Lectures and laboratory work. *Two hours.* Mr. CLARK.
The lectures include, aside from a review of the rock-forming minerals, a discussion of the origin, modes of occurrence, alterations, methods of determination, and uses of the more important rocks. In the laboratory the student is required to determine by means of the macro-physical properties a large number of rock specimens. Field excursions will also be made in order to acquire facility in the rapid determination of rocks in the field. Prerequisites, Mineralogy 1 and Geology 1.
11. **Petrography.** Lectures and laboratory work. *Three, four, or five hours.* Mr. CLARK.
This is a continuation of Course 10.

14. Chemical Mineralogy. Lectures and discussions. *Three hours.*
Professor KRAUS.

A critical study of the various chemical properties of crystals and minerals.

Must be preceded by Course 2 or its equivalent. A reading knowledge of scientific German is also necessary.

Of Courses 14 and 6, the one will be given which is desired by the greater number of students.

GEOLOGY

The courses in Geology are planned to meet the requirements of: (a) those desiring a general knowledge of geology as part of a liberal education (Courses 1a, 1b, and 3); (b) students of engineering whose profession makes some knowledge of geology essential; (c) teachers of science in secondary schools (Courses 1a, 1b, 3, 6, 12, and 13); (d) men who are to have in their hands the control or operation of mines (See the announcement concerning mine administration under Course in Commerce); (e) consulting geologists and geological engineers (See a special announcement of the six-year course in engineering) and (f) professional geologists. Students intending to become professional geologists are advised to be well grounded in physics and chemistry and to take a full year of work in mineralogy. Those intending to specialize in paleontology are required to have some knowledge of elementary biology. Except for Courses 3, 4, 9, 12, and 13, Course 1a or its equivalent is a necessary prerequisite. Course 1b is a prerequisite to all courses except 1a, 3, 12, 15, 16a, 16b, 17, 20, 21. The more advanced courses of the department, which interest a relatively small number of students, are generally given in alternate years.

Research is especially encouraged along the lines of dynamic and structural geology, stratigraphical geology, paleontology, glacial geology and geophysics. One or more advanced students may generally make arrangements for summer field work in connection with collecting trips in paleontology.

Courses 1a and 1b, the elements of geology, constitute an introduction to the subject and both are equally essential to an understanding of the elements of Geology. Course 1a should be followed where possible by 1b given in the second semester but 1a may be elected separately.

FIRST SEMESTER

- 1a. The Meaning of Earth Features. An introductory course in dynamical and structural geology intended to prepare the student for the equally important subject of historical geology (1b), as well as to supply the need for cultural treatment of physical geology. The course consists of illustrated lectures

and weekly recitations supplemented by excursions and laboratory work. Lectures, recitations, laboratory and excursions. *Three hours.* Professor HOBBS, Assistant Professor SCOTT, Dr. COOK, and assistants.

- 1E. Introduction to Geology, for Engineering and Forestry Students. A course adapted to the needs of students in these departments and not open to others except by special permission. Lectures, recitations, and laboratory. *Three hours.* Professors HOBBS and CASE, Assistant Professor SCOTT and assistant.
3. Physiography. Lectures, laboratory and frequent excursions. At least one long excursion during the course. *Three hours.* Assistant Professor SCOTT and assistant.
4. Systematic Invertebrate Paleontology. *Three hours.* With laboratory work. Professor CASE and assistant.
A course extending through the year, describing the origin and development of invertebrate animals. The principles of evolution and distribution as illustrated by the invertebrates are carefully worked out; the fossils are also treated as an aid in the study of stratigraphic geology. Work in invertebrate paleontology can be continued by special arrangement. Given in 1913-1914 and alternate years.
5. The Origin, Structure and Growth of Mountains. A course for advanced students and treating the conditions which give rise to mountains, the seismic and volcanic phenomena connected with their growth, and with the mechanics of folding and the types of flexures in mountain ranges. Given in 1913-1914 and alternate years. *Four hours.* Professor HOBBS.
17. Characteristics of Existing Glaciers. *Four hours.* Professor HOBBS.
A course of lectures and reading assignments upon the existing glaciers, with special emphasis upon their morphology, the conditions of their nourishment and waste, and their reactions with the lithosphere. Special attention is given to the continental glaciers of high latitudes and their relations to the former ice-sheets which are treated in Courses 18, 20, and 21. Given in 1914-1915 and alternate years.
8. Current literature of Geology. Graduates and other advanced students of the department will be expected, and others are invited, to meet one hour each week for reports and discussions of the recent literature of geology. Professors HOBBS and CASE, Assistant Professor SCOTT, Dr. COOK and Mr. LEVRETT.
19. Systematic Vertebrate Paleontology. *Three hours.* With laboratory work and reading. Professors CASE.
A course extending through the year describing the origin and development of vertebrate animals. The principles of evolu-

tion and distribution as illustrated by the vertebrates are carefully worked out; the fossils are also treated as an aid in the study of stratigraphic geology. Given in 1914-1915 and alternate years.]

- [11b. Stratigraphical Geology of North America. An account of the development of the continent as recorded in the deposits, the faunal changes and the diastrophic movements. The subject will be treated in a broad way, all possible matter bearing on the history of the continent being introduced and the student directed to the sources of information. *Three hours.* Professor CASE.

Prerequisite: Course 11a. Given in 1914-1915 and alternate years.]

13. Evolution of Man and the Domestic Animals. *Two hours.* Professor CASE.

A lecture course describing in a popular way the origin of man and the domestic animals. Especial attention is paid in this course to the early history of mankind and the stages of culture through which he has passed in attaining civilization. Given in 1913-1914 and alternate years.

15. Soil Geology. A comprehensive survey of the subject including the origin of soils, their physical and chemical constitution, the influence of climate on soil fertility, irrigation and drainage, tillage, fertilizers, etc., and a consideration of the geology of the United States in relation to geologic, physiographic and climatic factors. Geology 1a or 1E and Mineralogy 1 and 9 are prerequisites. *Three hours.* Dr. COOK.

- [16a. Economic Geology (non-metals). A general course treating of the nature, occurrence, and distribution of the non-metallic mineral resources such as coal, oil and gas, salt, gypsum, building stones, phosphate rock, etc. Geology 1a or 1E and Mineralogy 1 are prerequisites, while Geology 1b is strongly recommended. *Three hours.* Given in 1914-1915 and alternate years. Dr. COOK.

- [17. Metamorphism. A study of geology from the physico-chemical standpoint. This course is essential to an understanding of the origin and character of ore deposits. Prerequisites are Geology, 1a or 1E, and Mineralogy 2 or their equivalents, and a course in physical chemistry is strongly recommended. *Three hours.* Given in 1914-1915 and alternate years. Dr. COOK.]

19. Ore Deposits. A detailed study of the character, origin and exploitation of the iron, lead, zinc, copper, silver, and gold ores. This course should be preceded by Geology 1b and 1; Geology 16b is also recommended. *Three hours.* Given in 1913-1914 and alternate years. Dr. COOK.

22. Research Work. The department is prepared to direct research work along several distinct lines, viz., in dynamical and structural geology, stratigraphical geology, in glacial geology, in physiographical geology, in paleontology and in problems involved in the deposition of ores. Professors HOBBS and CASE, Assistant Professor SCOTT, Dr. COOK, and Mr. LEVERETT.

SECOND SEMESTER

- 1a. The Meaning of Earth Features. A repetition of Course 1a of the first semester. Lectures, recitations, laboratory, and excursions. Professor HOBBS, Assistant Professor SCOTT, Dr. COOK and assistants.
- 1E. Introduction to Geology for Engineering and Forestry Students. A course adapted to the needs of students in these departments and not open to others except with special permission. *Three hours.* Lectures, recitations, and laboratory. Professors HOBBS and CASE, Assistant Professor SCOTT and assistants.
- 1b. Historical Geology. An introductory course in historical and stratigraphical geology designed to follow Geology I so as to give the student a comprehensive idea of the scope of geology. This course gives an outline history of the development of the North American continent and its relation to other continents; the distribution of the various rocks upon the surface with something of their relation to economic products and geographical features; the origin and development of plants and animals in geological time. *Three hours.* Professor CASE and assistant.
- 4b. Systematic Invertebrate Paleontology. *Three hours.* With laboratory work. Professor CASE and assistant.
This course is a continuation of Course 4a, given in the first semester.
6. Field Geology. Each student, equipped with simple instruments will prepare topographic maps of districts near Ann Arbor, and enter upon them the geological formations represented. *Two or three hours.* Assistant Professor SCOTT.
- 9b. Systematic Vertebrate Paleontology. *Three hours.* With laboratory work and reading. Professor CASE.
This course is a continuation of Course 9a, given in the first semester.
10. History of Geology. An advanced course treating of the development of the science of Geology and of the lives and teachings of its founders, given in 1913-1914 and alternate years. *Three hours.* Professor HOBBS.

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- 11a. Interpretation of Geologic Maps. A course designed to give the student practice in the interpretation of geologic maps together with a detailed knowledge of the structural geology of typical regions in the United States. *Three hours.* (Given in 1913-1914 and alternate years). This course to be followed by 11b. Dr. COOK.
12. Elementary Meteorology. This course is designed to follow the course in physiography and is an elementary treatment of the dynamics of the atmosphere. In it will be discussed the properties and movements of the atmosphere, weather and its variations, together with some account of weather prediction. *Two hours.* Assistant Professor SCOTT.
- [14. Tectonic Geology. An advanced course which treats of the larger problems of the tectonics of the globe as developed especially by Eduard Suess in his *The Face of the Earth*. The work will be conducted by reports and discussions on the seminary plan of specially selected chapters from the four volumes of the work cited. *Four hours.* Professor HOBBS. Given in 1914-1915 and alternate years.]
15. Soil Geology. A repetition of this course as given in the first semester. *Three hours.* Dr. COOK.
- [16b. Economic Geology (metals). In this course the metallic mineral resources are treated in the same manner as are the non-metallic resources during the first semester. Although this course may be elected independently of Geology 16a, both are essential to a general survey of the subject. Prerequisites the same as for Geology 16a. *Three hours.* Given in 1914-1915 and alternate years. Dr. COOK.]
20. Pleistocene Glaciation of North America and Europe. A course of twelve lectures dealing with pleistocene glacial history. *One hour.* (See Course 21.) Mr. LEVERETT.
21. Glacial Field Studies. Weekly field excursions to study the glacial formations accessible from Ann Arbor. Supplementary to Course 20. Saturday afternoons after Easter vacation. *One hour.* Mr. LEVERETT.
22. Research Work. The department is prepared to direct research work along several distinct lines, viz., in dynamical and structural geology, stratigraphical geology, in glacial geology, in physiographical geology, in paleontology and in problems involved in the deposition of ores. Professors HOBBS and CASE, Assistant Professor SCOTT, Dr. COOK and Mr. LEVERETT.

GENERAL BIOLOGY

Courses 1 and 2 in General Biology are no longer given as such. In place of General Biology 1, students should elect Zoology 1 and Botany 1, which must be taken at the same time. In place of General Biology 2, students should elect Zoology 2 and Botany 2, which must be taken at the same time. These courses should be taken during the student's first year of residence. For regulations concerning their election see the descriptions under the department of Zoology and Botany, respectively.

The attention of students who propose eventually to take up the study of medicine is called to the announcement of the combined course in the Literary and Medical Departments, leading to the degrees of Bachelor of Arts and Doctor of Medicine, given on page 124.

The attention of students intending to study for the degree of Master of Science in Forestry is called to the special bulletin describing the Course in Forestry.

ZOOLOGY

The work of the zoological department is planned to meet the needs of the following classes of students:

1. Those seeking as part of a liberal education a knowledge of the concrete facts and the theories of biology. Such students should take at least the courses listed as introductory, but may in addition pursue to advantage any of the following courses: 3a, 4, 8, 8a, 9, 10, 21.

2. Students who are preparing to study medicine or dentistry and who have had Courses 1 and 2 in Zoology and in Botany or their equivalent, should take Courses 18, 9, 5, 8, and 10 in the order named.

3. Students of Forestry are required to take, after Courses 1 and 2 in Zoology and in Botany or their equivalent, Courses 3, 20, 6, and 7, and should if possible elect them in the order named.

4. Students preparing to teach Biology in secondary schools should elect, after Courses 1 and 2 in Zoology and in Botany or their equivalent, Courses 3, 3a, 4, 6, 8a, and 18a. This program, which represents a minimum preparation, may, upon consultation with the head of the department, be varied to fit individual needs.

5. Candidates for the higher degrees should consult the graduate announcement. Candidates for the degree of Doctor of Philosophy will usually take all the undergraduate courses, after which they may register in the more advanced courses. Their work should be selected only after consultation with the zoological faculty, but will always include Courses 11, 11a, 12, and 13.

The Zoological laboratory occupies the second and third floors of the South Wing of University Hall. It is described in the University Calendar.

For consultation hours of members of the Zoological faculty consult the departmental bulletin board.

All courses in Zoology, with the exception of Courses 3 and 24, should be preceded by Courses 1 and 2 in Zoology, and Courses 1 and 2 in Botany or their equivalent. These courses may be accompanied by Courses 3 and 3a. Subsequent work may be varied to suit individual needs, but the courses should be chosen under advice of the instructors.

The department of Zoology does not offer courses on fossil animals, but students of Zoology should consult the announcement of the department of Geology, where courses in *Paleontology* are described.

Students interested in the philosophical aspects of biology should elect Courses 3a and 22, offered in the department of Philosophy.

The department of Zoology gives opportunity for a limited number of students to become acquainted with the details of conducting a laboratory by serving as *voluntary assistants* without compensation or credit. Such assistants will receive training in collecting materials, in caring for laboratory rooms, glassware, and instruments, in the making of reagents, preparations, charts, etc., and in photography, as well as other things connected with a laboratory. The experience thus obtained forms the best possible practical preparation for teaching. Students appointed to these positions must have done creditable work in other courses and must either be taking or have had Courses 18 and 18a. Other things being equal preference will be given to those who have held these voluntary assistantships, in appointing regular assistants.

The length of the laboratory period varies with the capacity of the individual student, but is ordinarily three hours. These should be consecutive hours.

A laboratory fee of one dollar for each credit hour is required in courses that include laboratory or field work. The fee should be paid to the University Treasurer and the receipt presented to the instructor at the time of enrolling in the course.

FIRST SEMESTER

I. *Introductory Courses.*

1. Elements of Animal Biology. Lectures and laboratory. Two hours. Assistant Professors SHULL and LARUE, Mr. OKKELBERG, and assistants.

An introduction to the study of protoplasm, of the cell and its activities, and of the structure, development, and biology of invertebrate animal types selected to illustrate general principles. In addition to serving as a presentation of biological principles the course especially emphasizes training in observation and in interpretation of zoological phenomena.

Course 1 should be elected simultaneously with Course 1 in Botany. It may be taken alone only in exceptional cases, and after obtaining permission from the instructor.

3. Organic Evolution. Lectures. *One hour.* Professor REIGHARD. (Other lecturers may, by invitation, take part in the course.) The illustrated lectures deal in a popular way with the evidences for evolution drawn from classification, structure, development, paleontology, distribution, variation, and experiment, and under the head of factors, with such topics as natural selection, the inheritance of acquired characters, and the influence of environment. No prerequisite.
20. Economic Zoology. Lectures and laboratory. *Three hours.* Assistant Professor HEGNER and Mr. SINK.
The aim of this course is to give a general survey of the animal kingdom by means of lectures, a text-book and laboratory demonstrations, emphasizing those groups that are of special economic importance. The groups of animals particularly emphasized are the protozoa, the parasitic worms, the fishes, birds and mammals.

II. Advanced Courses.

4. Invertebrate Zoology. The structure, classification, distribution and activities of invertebrate animals exclusive of the Arthropoda. Lectures, laboratory, and field work. *Five hours.* Assistant Professor HEGNER.
The laboratory work consists of (1) the dissection of one or more type forms of each of the groups studied; (2) a comparison of forms related to the ones dissected; (3) a study, when possible, of the behavior of representative forms. All invertebrate groups are considered, but an effort is made to avoid repetition of work given in Course 1. The field trips will be devoted to collecting material to be examined in the laboratory and to the study of the local fauna.
8. Vertebrate Zoology, (Comparative Anatomy and Physiology). Lectures and laboratory. *Five hours.* Professor REIGHARD.
Lectures on the comparative anatomy and comparative physiology of vertebrates. Laboratory work on vertebrate types, fish, amphibian, reptile, bird and mammal. The course may be taken independently of Course 8a or in preparation for it. It is of value to those students preparing to study medicine or dentistry who do not wish to take Course 8a, as well as to teachers and others.
9. Embryology of Vertebrates. Lectures and laboratory. *Five hours.* Professor GLASER.
This course is an introduction to the principles of embryological science as illustrated by the development of vertebrates. The lectures will be comparative; the laboratory work, largely on the organogeny of the chick, will be supplemented by demonstrations of other forms. Considerable attention will be given to embryological laboratory methods. This course should be preceded by Zoology 2, or some other adequate equivalent in vertebrate anatomy, histology, and physiology.

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11. Zoological Seminary. *Two hours.* Lectures, readings, conferences and reports. Professor GLASER.
Subject: Vitalistic and Mechanistic Conceptions of Life. Students should consult Professor GLASER before electing this course.
19. Genetics. *Two hours.* Lectures. Assistant Professor SHULL.
A discussion of special phases of heredity and experimental evolution, with emphasis on the work of the last decade. This course is intended primarily for graduate students, but advanced undergraduates may be admitted with the consent of the instructor.
18. Comparative Histology. Lectures and laboratory. *Three hours.* Assistant Professor LARUE.
This course deals with the structure and genesis of the chief types of animal tissues. Representative muscular, epithelial, sustentative and nervous tissues are studied. The subject is considered from a comparative standpoint, and the progressive differentiation of tissues in the animal series is dwelt upon.
26. Advanced Zoological Studies. Advanced students who desire to undertake zoological studies not involving research and not otherwise provided for in the Announcement may elect this course with any member of the Zoological faculty after consultation with the head of the department. *Credit to be arranged.*

III. *Special Courses for Undergraduates and Graduates.*

22. Zoological Problems.
This course is intended to introduce the student to the methods used by the investigator in zoology. The work is individual. To each student will be assigned a topic. He will be required to examine the original literature and to prepare specimens illustrating the topic. The results of his work must be embodied in an essay. The course is required of those electing zoology as a major subject for the master's degree, and may at the option of the zoological faculty be required of those selecting zoology as a major for the doctorate. Application should be made to Professor REIGHARD; the work may be pursued under the direction of any member of the zoological faculty.
Credit to be arranged.
16. Classification and Natural History of Animals.
The course may be elected as 16a, *two hours*; 16b, *three hours*, or 16c, *five hours*. Permission must first be obtained from Professor REIGHARD.
The time and place of carrying on the work should be arranged, in accordance with the group selected with the members of the staff named below:
The Fishes: Professor REIGHARD.
The Reptiles: Assistant Professor RUTHVEN.

The Thysanoptera: Assistant Professor SHULL.

Animal Parasites: Assistant Professor LARUE.

The purpose of this course is to increase our knowledge of the fauna of the region and to give students an opportunity to become acquainted with the methods and aims of systematic work, and the natural history and classification of the forms in particular groups.

14. Research Work in Zoology.

For the year 1913-1914 the following lines of work are offered:

By Professor REIGHARD: The behavior of fishes and other lower vertebrates in their natural environment.

By Professor GLASER: Problems in the Physiology of Development.

By Assistant Professor HEGNER: The Cytology of the Germ Cells of Arthropods.

By Assistant Professor SHULL: Problems in Genetics.

By Assistant Professor LARUE: Helminthology.

This course is designed for graduate students, but undergraduates may, by special permission, elect it. All applications should be made to Professor REIGHARD. It may be elected as 14a, two hours; 14b, three hours; 14c, five hours; 14d, ten hours.

12. Literature of Zoology. *One hour.* Professor REIGHARD and Assistant Professor SHULL.

The instructors and advanced students form a Journal Club, which holds weekly meetings. Reports are made on research work done by members of the zoological staff, and on important current papers, and are followed by informal discussion. Although the meetings are open to all, the membership is restricted. The course should be elected only after consultation.

28. German Reading. *Two hours.* Assistant Professor LEE.

Classical biological treatises in German as well as important papers in the current literature will be selected. The purpose of the course is to cultivate facility in reading the literature of biology and to familiarize the student with the technical terms of the science. The course should be of value to students of zoology, botany, medicine and related sciences.

SECOND SEMESTER

1. *Introductory Courses.*

2. Elements of Animal Biology; the Structure, Development, and Biology of a Typical Vertebrate (the frog). Lectures and laboratory work. *Two hours.* Assistant Professors SHULL and LARUE, Mr. OKKELBERG, and assistants.

Course 2 should be taken simultaneously with Course 2 in Botany. It may be taken alone by permission of the instructor.

3a. Heredity. *Two hours.* Lectures. Professor GLASER.

The lectures on Heredity attempt to give a popular exposition of investigations which since the year 1900 have revolutionized this field. The subjects dealt with are: The Physical Basis and the Laws of Reproduction; Mendel's Law together with its theoretical implications and practical applications; Inheritance of Physical and Mental Traits in Man; Current Misconceptions, Mistakes, and Superstitions; and the Modern Eugenic Movement. This course is intended to meet certain needs, common to all classes of students, but those specializing in biological and social sciences in the widest sense, will find it important from their several professional standpoints.

24. Origin and Natural History of Animals. *One hour.* Professor REIGHARD and Assistant Professor HEGNER.

This course is intended for those who wish to have a general knowledge of the natural history of animals and of zoological problems but are unable to pursue the more technical courses in zoology. Lectures illustrated with lantern slides will include the following subjects: The Origin of Life, Variety and unity in Animal Life, Geographical Distribution, The Origin of Vertebrates, The Origin of Domestic Animals and the Origin of Man. All the members of the zoological staff will take part in the lectures.

II. *Advanced Courses.*

11a. Zoological Seminary. *Two hours.* Professor REIGHARD.

This course deals especially with the method of evolution. In addition to occasional lectures it includes reports on reading, with discussions, and will afford some opportunity for the examination of illustrative material.

Some acquaintance with the subject matter of zoology or botany and a reading knowledge of French and German are desirable.

8a. Vertebrate Zoology, (Natural History of Vertebrates, with special reference to the principles of Animal Behavior). Lectures, laboratory, and field work. *Four hours.* Professor REIGHARD.

This course seeks to acquaint the student with the classification of vertebrates, with special reference to the local forms, and with their habits and external adaptations. It includes field work, carefully planned and regularly carried out on the field, recognition and habits of fishes, amphibia, birds and mammals. Emphasis is laid on methods of field observation and on field notes. The data collected, together with laboratory experiments, are made the basis of a discussion of the *principles of animal behavior*. The course is best preceded by Course 8, but exceptions may be made to this requirement.

[7. Advanced Entomology. A course intended for those who have taken an elementary course in Entomology and wish to undertake more advanced work for the purpose of specializing in

some particular phase of the subject. It may be elected for *two hours, three hours, four hours, five hours, or six hours.* The course will necessitate consultations, readings, laboratory and field work and written reports. The hours are to be arranged with the instructor, who should be consulted before registering. Assistant Professor HEGNER.

This course will be omitted in 1913-1914.]

27. Cellular Biology. *Three hours.* Lectures and laboratory. Assistant Professor HEGNER.

The following are some of the topics that will be considered in this course: the structure and composition of protoplasm, the morphology and physiology of the cell, cell division, the origin and history of germ cells, fertilization, cell organization, and some of the fundamental phenomena of embryonic development.

5. Mammalian Anatomy. Recitations and laboratory. *Five hours.* Mr. OKKEBERG.

The course deals with the anatomy of a mammal (the cat) whose structure closely resembles that of man. It is meant for those who, for any reason, desire some knowledge of human anatomy, but who find it impossible to pursue human dissection. While it may properly form part of a general culture course, it is of especial value to those intending to teach physiology in the secondary schools, or to enter upon a medical course.

10. Physiological Zoology. *Two or four hours.* Lectures and laboratory. Professor GLASER.

A course in general physiology based on the phenomena of development. The subjects considered are: distinguishing characteristics of living substance; theories as to its origin; its physical and chemical nature; the physiology of development, growth and regeneration, including a study of stimulation, metabolism and energy transformation, as well as a consideration of the general conditions under which life occurs. The work may be elected as a lecture course, two hours, or with two laboratory periods. Those who desire to do so, and are properly qualified, may carry on special work in connection with Course 15. Some knowledge of physics and chemistry is presupposed.

6. Forest Entomology. *Three hours.* Lectures, laboratory and field work. Assistant Professor HEGNER, Mr. SINK.

A course in the habits, life histories, and structure of insects. The course is especially adapted to meet the needs of forestry students.

- 6a. General Entomology. *Three hours.* Lectures, laboratory and field work. Assistant Professor HEGNER.

This course deals with the habits, life histories, and structure of the Arthropoda, with special reference to the biological and

economic aspects of the subject. It aims especially to present the subject matter of entomology in such a way as to meet the needs of those who desire to teach zoology in secondary schools.

25. Zoogeography. Lectures and Laboratory. *Three hours.* Assistant Professor RUTHVEN.

The course is a discussion of the distribution of animals, approached not from the standpoint of the present distribution of animal groups, but rather from the point of view of the factors involved in migration and ecesis. It deals with those relations existing between the animal forms concerned and the environment, that have an influence upon distribution, and upon this basis an attempt is made to interpret the present conditions.

The lectures discuss the general subject and are supplemented by field and laboratory work upon the local fauna and museum material. The student thus becomes familiar with materials illustrative of the principles discussed in the lectures as well as with methods of study.

- 18a. Zoology for Teachers. *Three hours.* Lecture and laboratory. Assistant Professor LARUE.

The aim of this course is to give preparation for teaching in secondary schools. The lectures give a general survey of the field, and methods of teaching are considered. Laboratory work includes methods of collecting and preparing material; making reagents, charts, microscopic slides, etc.; photography; museum methods; practice teaching. Opportunity will be given students to make sets of preparations which will be of use in secondary schools.

- [21. Fresh Water Biology. *Three hours.* Lecture, laboratory and field work. Assistant Professor SHULL.

The course treats of the fresh water invertebrates, their classification, ecology, economic importance and of the quantitative methods of studying them. It is of use to forestry students in connection with Course 7, and to teachers, as well as of general interest.

This course is omitted in 1913-1914, but will be given in 1914-1915.]

- 26a. Advanced Zoological Studies. A continuation of Course 26. Subjects and credits the same. Application should be made to Professor REIGHARD.

III. *Special Courses for Undergraduates and Graduates.*

23. Zoological Problems. Identical with Course 22, which see. Hours and credit to be arranged. Application should be made to Professor REIGHARD.

17. Classification and Natural History of Animals. Continuation of Course 16. The course may be elected as 17a, *two hours*; 17b, *three hours*, or 17c, *five hours*. Application should be made to Professor REIGHARD.
- The subjects and the teachers are the same as in Course 16.
15. Research Work in Zoology. This course is a continuation of Course 14. It may be elected as 15a, *two hours*; 15b, *three hours*; 15c, *five hours*; 15d, *ten hours*. Application should be made to Professor REIGHARD.
- For details, see Course 14.
13. Literature of Zoology. Continuation of Course 12. *One hour*. Professor REIGHARD.
- Course 13 has the same restrictions as Course 12.
- 28a. French Reading. *Two hours*. Assistant Professor LEE. This course is of the same nature as the course in German reading (28) offered during the first semester.

BOTANY

A year's work in General Biology is required to precede all subsequent courses in Botany, except Courses 5, 10a, 10b, and 36. General Biology consists of Botany 1 taken with Zoology 1, and Botany 2 taken with Zoology 2.

Courses 1 and 2 are intended primarily for undergraduates. Courses 1a and 5 to 36 inclusive are for undergraduates and graduates. Courses 37 to 54 inclusive are primarily for graduates, but competent undergraduates may be admitted to them by special permission.

Students are offered the following advice:

1. Those wishing to become acquainted with flowering plants in the field should take Courses 21 and 22, besides the two courses in General Biology.

2. Those intending to teach in the secondary schools should take Courses 1 or 1a, 2, 6, 9, 18, 21, 22, 24, 25, 26, 30a, 33, and 38.

3. Those preparing for college positions should take in addition to the courses designated in the last paragraph, some problem in research.

4. Those preparing for professional forestry are required to take Courses 1, 2, 13, 14, 17, and 26, and are advised to take Course 24.

5. Those preparing for professional work in plant pathology should take Courses 1 or 1a, 2, 17, 18, 20, 21, 26, 33, 38, and some problem in pathological research.

6. Those preparing for professional work as food analysts should take Courses 5, 10a, 10b.

7. Besides the usual opportunities for positions in the care and management of forests, there is a growing demand for specialists in forest pathology, in the utilization of forest products, and in various departments of agriculture and plant industry.

Students desiring to prepare themselves for any of the kinds of work herein mentioned should take as undergraduates the courses designated in paragraph 4 or 5 above. In the graduate work, the completion of a major in botany and a minor in forestry, or a minor in botany and a major in forestry will prepare for the various kinds of professional work indicated. Students should consult with the professors of botany, forestry, and other departments concerned for aid in laying out their course of study.

Consultation.—The botanical faculty will be in Room 106, S. W., 10:30 to 11:30 and 3:00 to 4:30 on Monday and Tuesday of the opening week of the first semester, for consultation with students.

FIRST SEMESTER

1. Elements of Biology (Plant Life). Lectures and laboratory. *Two hours.* Professor POLLOCK, Assistant Professor HUS, Mr. TUPPER, and assistants.

A study will be made of the properties and activities of protoplasm, developmental history, evolution of structure and function, and relation to environment. The material for study will be selected from simple organisms, chiefly algae and fungi.

Course 1 should be elected simultaneously with Course 1 in zoology, the two constituting the former Course 1 in General Biology. Course 1 in Botany may be taken alone only in exceptional cases, and after obtaining permission of the instructor.

Laboratory fee \$2.00, to be paid to the treasurer of the University and the receipt given to the instructor in charge of the laboratory work.

- 1a. Morphology, Physiology, and Classification of Algæ. Lectures and laboratory work. *Two hours.* Assistant Professor KAUFFMAN.

A course in the identification of the principal genera, their life-histories, and their place in the evolution of the plant kingdom. This course properly follows General Biology 1 and 2, but, by permission of the instructor, may be taken in place of the botany part of General Biology by those who have had a year of standard high school botany.

5. Elementary Structural Botany. *Two hours.* Lectures and laboratory work. Assistant Professor HUS.
This course is primarily for pharmacy students; literary students will be admitted on special permission only.

- [9. Reproduction and Embryology of Flowering Plants. Lectures and laboratory. *Three hours.* Professor NEWCOMBE.
Omitted in 1913-1914.]

This course treats of the morphology of the flower, of the development of the pollen and embryo sac, of fertilization and the development of the embryo. In the preparation of their own material, students obtain practice in technique.

This course should follow Course 6.

13. Forest Botany. *Four hours.* Lectures, field and laboratory work. Mr. PIETERS and assistants.

The work of this course will consist of the study of the external morphology, the identification and classification, and the biology of the trees, shrubs, and herbaceous plants of the forest societies. By the requirement of field notes, and laboratory notes and drawings, students will have practice in the methods of descriptive botany and dendrology.

While the course is designed primarily for forestry students, others will be admitted if their preparation has been such as to satisfy the instructor.

17. Morphology, Physiology and Classification of Fungi. *Four hours.* Lectures, quizzes, field, and laboratory. Assistant Professor KAUFFMAN.

This course is primarily for students intending to study forestry. Special attention will be paid to those fungi causing diseases of trees and decay of wood.

Students must arrange their sections with the instructor before depositing their election blanks.

19. Advanced Mycology and Pathology. Conferences, readings, field and laboratory work. *Three, five or eight hours.* Assistant Professor KAUFFMAN.

This course will give practice in the identification and classification of fungi, and the study of their literature. It will be especially useful for students who wish to prepare for positions in Experiment Stations or in the U. S. Government work. It must be preceded by Course 18, and should be followed by Course 43 or 48.

21. Morphology, Ecology and Classification of Plants. *Four hours.* Lectures, readings, field and laboratory work. Professor NEWCOMBE.

The first part of the course is given to the classification and ecology of flowering plants by field studies. The remainder of the semester is given to the morphology of flowering plants and the correlation of plant structures with their functions and habits.

- [25. Laboratory Methods and Management. Teachers' Course. *Two hours.* Conference and field work. Professor NEWCOMBE.

In this course the student is made acquainted with the means for planning and equipping a laboratory; with the collection and preparation of plants for morphological study, for museum and herbarium; with the making of stains and reagents; with photography and the preparation of lantern slides; and with the planning and conduct of courses of study. Omitted in 1913-1914.]

This course should come after two or three years of botanical study.

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29. Botanical Readings in French. *One hour.* Assistant Professor HUS.
Students must have done some reading in French before admission to this course.
33. Current Literature of Botany. *One hour.* Professor NEWCOMBE.
Course 33 constitutes a Journal Club in which important papers on botany are reviewed and discussed by the instructors and advanced students. All students are admitted to the meetings, but only advanced students may elect the course.
37. Investigations in Physiology. This work may be elected as 37a, *three hours*; 37b, *five hours*; 37c, *eight hours*; 37d, *ten hours.* Professor NEWCOMBE.
39. Investigations in the Role of Fungi in Soil Fertility. This work may be elected as 39a, *three hours*; 39b, *five hours*; 39c, *eight hours*; 39d, *ten hours.* Professor POLLOCK.
41. Investigations in the Bacterial Diseases of Plants. This work may be elected as 41a, *three hours*; 41b, *five hours*; 41c, *eight hours*; 41d, *ten hours.* Professor POLLOCK.
- [43. Investigations in Ecology. This work may be elected as 43a, *three hours*; 43b, *five hours*; 43c, *eight hours*; 43d, *ten hours.* Assistant Professor GLEASON. Omitted in 1913-1914.]
45. Investigations in Mycology and Pathology. This work may be elected as 45a, *three hours*; 45b, *five hours*; 45c, *eight hours*; 45d, *ten hours.* Assistant Professor KAUFFMAN.
47. Investigations in the Physiology of Reproduction in Algae, Mosses or Ferns. This work may be elected as 47a, *three hours*; 47b, *five hours*; 47c, *eight hours*; 47d, *ten hours.* Assistant Professor KAUFFMAN.
49. Investigations in Genetics. This work may be elected as 49a, *three hours*; 49b, *five hours*; 49c, *eight hours*; 49d, *ten hours.* Assistant Professor HUS.

SECOND SEMESTER

2. Elements of Biology (Plant Life). *Two hours.* Professor POLLOCK, Assistant Professor HUS, and Mr. TUPPER.
Lectures and Laboratory work, as announced under Course 1. Continuation of Course 1, embracing the alternation of generations and the general biology and physiology of liverworts, mosses, ferns, gymnosperms, and flowering plants.
Several field trips will be taken to give some acquaintance with trees, shrubs or flowers out-of-doors.
6. Morphology, Physiology, and Classification of Liverworts, Mosses, and Ferns. Lectures, and field and laboratory work. *Three hours.* Assistant Professor KAUFFMAN.
This course is a continuation of Course 1a. It may be taken with Course 18. All three courses aim primarily to secure acquaintance with the local cryptogamic flora. Course 6 deals with the identification of the Archegoniates of this region, and the biological facts and theories which they illustrate.

- 10a. The Microscopy of Foods, Drugs, and Spices. Lectures and laboratory. *Three hours.* Dr. HUBBARD and Mr. ROGERS.
- 10b. Advanced Microscopy of Foods, Drugs, and Spices. *Two or four hours.* Laboratory work. This course is intended for those fitting themselves to be food analysts. Dr. HUBBARD and Mr. ROGERS.
14. Forest Botany. Continuation of Course 13. *Four hours.* Lectures, field and laboratory work. Mr. PIETERS and assistants. In this course there will be two sections at the same hours as in Course 13. The first part of the semester will be spent in the study of the development, structure and function of the tissues of woody plants. The last part of the semester will resume the outdoor study of forest plants.
18. Mycology and Pathology. Lectures, field and laboratory work. *Three hours.* Assistant Professor KAUFFMAN.
This course aims at a general knowledge of the morphology, physiology and classification of fungi, together with their artificial cultivation, and their relation to disease. It is especially adapted for teachers and those intending to specialize in pathology.
20. Advanced Mycology and Pathology. Conferences, readings, field and laboratory work. *Three hours.* Assistant Professor KAUFFMAN.
This course will give practice in the identification and classification of fungi, and the study of their literature. It will be especially useful for students who wish to prepare for positions in Experiment Stations or in the U. S. Government work. It must be preceded by Course 18, and should be followed by Course 43 or 48.
- 20a. Seminary in Mycology. *One hour.* Assistant Professor KAUFFMAN.
Admission only by permission of the instructor.
- [22. Advanced Morphology, Ecology and Classification of Plants. *Four hours.* Lectures, readings, field and laboratory work. Assistant Professor GLEASON.
See Course 21 for a description of Course 22.
Omitted in 1913-1914.]
- [24. Phytogeography of North America. Lectures and assigned readings. *Two hours.* Assistant Professor GLEASON.
Beginning with a description of the vegetation of Michigan and its geographical relations, this course will next proceed to a review of the floral formations of North America. This will be followed by a study of the historical development of the flora, the influence of the glacial periods, and the modern dynamic trends of vegetation.
Omitted in 1913-1914.]

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26. Experimental Physiology. Lectures and laboratory. *Four hours.* Professor NEWCOMBE.
A study of the relation of plants to their environment as manifested by the phenomena of nutrition, growth, and irritability. Students must arrange their sections with the instructor before filing their election blanks.
- 30a. Plant Variation and Breeding. *Three hours.* The course will consist of lectures, demonstrations, and reading. Assistant Professor HUS.
- 30b. Plant Variation and Breeding. *Three hours.* Conferences, readings, field and laboratory work. Assistant Professor HUS.
This course must be preceded by Courses 1 and 2 in General Biology, Courses 21 and 26 in Botany.
- 30c. Seminary in Genetics. *One hour.* Assistant Professor HUS. Admission only by permission of the instructor.
34. Botanical Readings in German. *One hour.* Assistant Professor HUS.
Students must have done some reading in German, before admission to this course.
- [36. Tropical Food Plants and Food Products. *One hour.* Lectures and assigned readings. Assistant Professor GLEASON.
This non-technical course is open to all students without prerequisite. In it is presented general information of cultural value concerning the source, history, cultivation, preparation, and commercial importance of such well-known food plants as coffee, tea, spices, rice, sugar, dates, bananas, cocoanuts, pineapples, and others. The lectures are illustrated by lantern slides.
Omitted in 1913-1914.]
38. Current Literature of Botany. Continuation of Course 33. *One hour.* Professor NEWCOMBE.
42. Investigations in Physiology. This work may be elected as 42a, *three hours*; 42b, *five hours*; 42c, *eight hours*; 42d, *ten hours*. Hours to be arranged. Professor NEWCOMBE.
44. Investigations in the Role of Fungi in Soil Fertility. This work may be elected as 44a, *three hours*; 44b, *five hours*; 44c, *eight hours*; 44d, *ten hours*. Hours to be arranged. Professor POLLOCK.
46. Investigations in the Bacterial Diseases of Plants. This work may be elected as 46a, *three hours*; 46b, *five hours*; 46c, *eight hours*; 46d, *ten hours*. Hours to be arranged. Professor POLLOCK.
- [48. Investigations in Ecology. This work may be elected as 48a, *three hours*; 48b, *five hours*; 48c, *eight hours*; 48d, *ten hours*. Hours to be arranged. Assistant Professor GLEASON.
Omitted in 1913-1914.]

50. Investigations in Mycology and Pathology. This work may be elected as 50a, *three hours*; 50b, *five hours*; 50c, *eight hours*; 50d, *ten hours*. Hours to be arranged. Assistant Professor KAUFFMAN.
52. Investigations in the Physiology of Reproduction in Algae, Mosses or Ferns. This work may be elected as 52a, *three hours*; 52b, *five hours*; 52c, *eight hours*; 52d, *ten hours*. Hours to be arranged. Assistant Professor KAUFFMAN.
54. Investigations in Genetics. This work may be elected as 54a, *three hours*; 54b, *five hours*; 54c, *eight hours*; 54d, *ten hours*. Hours to be arranged. Assistant Professor HUS.

LANDSCAPE DESIGN

Courses 1, 2, 3, 4, 6, 7, are open to all students who have completed at least two years in the University, or can satisfy the instructors of their fitness to pursue the work. Other courses are open only to students working for the degree in Landscape Design, or by special permission. Course 1 should precede all other courses. Course 4 must be preceded by Course 3. Courses 7 to 12 are designing courses; each period implies three hours work; and when outside work is necessary, such as stadia surveying, ground measurement, and inspection, the entire morning or entire afternoon will be required, at the discretion of the instructor.

Those interested in landscape design are referred to the special announcement of the Course in Landscape Design which may be obtained by application to the Secretary's office.

Students wishing to consult about these courses will find Professor Tealdi in his office at the hours posted in the main building of University Hall. Other hours by appointment; telephone University Exchange 110-M or City Exchange 1190-M.

FIRST SEMESTER

1. Introduction to the Study of Landscape Design. Lectures, collateral reading, and reports. *Two hours*. Professor TEALDI and assistant, with occasional lectures by Mr. SIMONDS.

Course 1 is designed to give a general knowledge of the variety of problems to be met with in the practice of landscape gardening. It is not intended as a technical course, such as a course in construction of design. The general problems are treated separately and special stress is laid upon the subject of good taste and common sense in all problems, from the simple arrangement of the city yard to the laying out of a country estate. During the first weeks of the semester one lecture may be omitted and a two-hour or three-hour period may be devoted to the actual study of local examples. The lectures are illustrated by the use of the stereopticon.

2. Development of Landscape Gardening in England. Lectures, with collateral reading and reports. *Two hours.* Professor TEALDI and assistant.

The object of this course is to follow the gradual development of gardening in England from the earliest efforts to the present day, laying special stress upon the transition of styles and the development of the Naturalistic or English style. The lectures are illustrated by the use of the stereopticon.

3. Study of Materials for Planting Design: Trees and Shrubs. Lectures, reports and field work. *Three hours.* Professor TEALDI and assistant.

Course 5 is intended to make the student familiar with the shrubs and trees generally used in landscape gardening. It is not intended as a course in botany; courses in botany and ecology are prerequisites to this course. The æsthetic values of plants are to be studied; their shape, size, habits, favorite habitat, their autumn coloring both of leaves and fruit, and their general aspects in autumn and winter. One field trip a week is taken, and a report of the trip is required. During the second part of the semester the field trip is omitted; the period is devoted to laboratory work when the entire afternoon may be required. The lectures are illustrated by the use of the stereopticon.

7. Design of Home Grounds. Study of local examples of private grounds. Solution of original problems. Drafting, conferences and collateral reading. *Three hours.* Professor TEALDI.

The work in Course 10 consists chiefly of the application to actual problems of the knowledge acquired in Courses 3, 4 and 6. The students are required to work out problems presented to them in definite form by the instructors, with the same attention to details which is necessary in actual office practice. The drafting consists of plans, profiles, colored sketches, and finished drawings.

9. Principles of Park Planning(1): Parks and Park Systems. *Four hours.*

11. Design of Cemeteries. *Four hours.*

SECOND SEMESTER

1. Introduction to the Study of Landscape Design. Lectures, collateral reading, and reports. *Two hours.* Professor TEALDI and assistant, with occasional lectures by Mr. SIMONDS.

This is the same course as given in the first semester, only that outside work is done during the latter part of the semester.

4. Study of Material for Planting Design: Trees, Shrubs, and Perennials. Lectures, planting plans, reports, and field work. *Three hours.* Professor TEALDI.

Course 4 is a continuation of Course 3. The trees and shrubs are studied chiefly in relation to their flowering and leafing characteristics and their ornamental values in spring and summer. Hardy herbaceous perennials are studied also along the same lines. Planting plans with estimate of cost are required from time to time. The lectures are illustrated by the use of the stereopticon.

6. Practice in Design. Study of local examples, sketch plans, reports. Solution of simple original problems based on topographical surveys. Field work, drafting and conferences. *Three hours.* Professor TEALDI and assistant.

Course 6 is open only to those students who have passed satisfactorily in Courses 3 and 4, or who can satisfy the instructor that they have done equivalent work.

8. Design of Large Country Places. *Four hours.*

Whereas Course 7 deals with home grounds proper whether in the city or in the country and therefore with moderate sized and small areas which offer the restricted problems common in cities and suburbs, Course 8 deals with larger problems in which the broad lay-out is the main feature. Actual surveys are used in this and the following courses as the basis of all problems.

10. Principles of Park Planning (II): Continuation of Course 9. *Four hours.*
12. Principles of City Planning. *Five hours.*

FORESTRY

The courses in forestry are open to all students in the University, although many are intended primarily for regular forestry students.

The following courses are of a highly technical nature and would be of little use to the general student, but may be elected by special permission of the instructor: Courses 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23.

Courses 2, 22 and 26 are adapted to the general student and to the teacher and have no prerequisite courses.

A number of courses, although essentially technical, have a general value to the student who desires work along certain lines, as lumbering, private estate work, etc. Included in these courses are numbers 3 to 6, 13 to 16 and 23. Permission from the instructor must be received before electing.

Course 3 is especially valuable to the architect and Course 24 to all engineers, especially the civil engineer.

Courses will be recommended for various lines as forest engineer, forest entomologist, forest pathologist, forest grazing expert, city forester, and others,

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All courses or their equivalents are required of the regular forestry student except 22, 24 and 26. Courses 11 and 12 may be taken in any semester of the fourth and fifth years; one semester is required.

All instructors in forestry will be glad to consult with students, the hours for such consultations to be posted in forestry lecture rooms.

FIRST SEMESTER

1. Introduction to Forestry. A general presentation of the subject, its history, objects, methods, as well as its economic importance. Lectures. *Four hours.* Professor ROTH.
Open to all students.
3. Timber. Identification of woods. Study of physical, chemical and mechanical properties of woods; relation of these properties to seasoning, kiln drying, and preservative treatment, study of such forest products as turpentine, wood pulp for paper, and the products of dry distillation.
One lecture and two laboratory periods of four hours each. *Three hours.* Mr. YOUNG.
Prerequisites, Physics 1, Botany 13 and 14, Chemistry 1, 1a, 2, 2a.
5. Silvics. Life of the tree, its habits and behavior in the woods. Includes structure and functions of the roots, stem, leaves and fruit, the effects of soil, climate, light, and other factors upon the tree and the forest in general and upon the important timber trees and forests in definite regions.
Three lectures and one laboratory or field period. *Three hours.* Professor SPONSLER.
Prerequisites, Botany 13 and 14 and Forestry 1.
7. Forest Mensuration. Timber estimating and scaling; methods of surveying and mapping of forest lands; methods used in forest investigations for measuring volumes of single trees and entire stands of timber; study of rate of growth of single trees and yield in volume of entire stand.
Two lectures and two laboratory or field periods. *Four hours.* Mr. YOUNG.
Prerequisites, Surveying 12 and 13, Botany 13 and 14, Mathematics 1 and 2.
9. Silviculture. Natural restocking of the forest by seed and sprout. Systems of treatment; character and choice of different forms of treatment; handling woodlots; care of the forest; care of the soil; thinnings.
Four lectures and one laboratory or field period. *Four hours.* Professor SPONSLER.
Prerequisites, Forestry 6, Botany 26. Geology 15 must precede or accompany this course.

11. Forestry Problems. Research work in various phases of forestry. Open to fourth and fifth year students. *Two, three, or four hours.*
Professors ROTH and SPONSER, Assistant Professor LOVEJOY, and Mr. YOUNG.
13. Utilization. Uses of timber; points of production and market; methods of lumbering, milling and marketing; minor forest industries. Lectures and field work.
Three hours. Assistant Professor LOVEJOY.
Prerequisites, Surveying 12 and 13 and Forestry 1.
15. Forest Management. General forest surveys and preparation of working plans; administration and regulation of the field and office work in the care of a large tract of timber and the methods of calculation involved in judging the value of forests and forest operations. Lectures. *Four hours.* Professor ROTH.
Prerequisites, Forestry 7, 8, 9, 10, 13, and 14.
17. Dendrology. Classification and identification of the important forest trees of the United States. Composition of the forest types in the various forest regions.
Two lectures and two hours' laboratory. *Two hours.* Professor SPONSER.
Prerequisites, Botany 13 and 14; Forestry 1, 5, and 6.
19. Seminar. Reports on special topics are intended to familiarize the students with the topics themselves and with sources of information and methods of presentation.
This course is open only to candidates for the master's degree in forestry in their last year.
Three hours. Professor ROTH and SPONSER, Assistant Professor LOVEJOY, and Mr. YOUNG.
21. Silviculture Practice in the Lodgepole Pine and the Douglas Fir Types. Silvicultural conditions in the Central Rocky Mountain and Puget Sound regions. Classification and characteristics of types and sub-types; development of stands and growth in relation to management and utilization; marking on timber sales; disposal of debris; artificial and natural reproduction. *Two hours.* Assistant Professor LOVEJOY.
Prerequisites, Forestry 9 and 10.
23. Forest Protection. Enemies of the forest as they affect the work of the forester. Meteorological injuries and methods of prevention. Occurrence, preventive and protective measures in the attack of insects and fungi. Occurrence, prevention and suppression of forest fires, rating of fire risk, proportionate protection, laying out and operation of fire patrol and fire fighting systems. Civil and criminal procedure in trespass cases. Forest laws. *Two hours.* Assistant Professor LOVEJOY.
Prerequisites, Forestry 4, 9, and 10, Botany 17, Zoology 6.

SECOND SEMESTER

2. Woodlots and Forest Parks. Importance to individuals and communities. Value from economic, æsthetic, and physical viewpoints. Distribution and extent in the United States. Present condition. Methods of locating, establishing, handling, exploiting, and reproducing or perpetuating. Open to all students. No prerequisites. Two lectures and an occasional field trip.
Two hours. Professor SPONSER.
4. Forest Improvements. Planning, locating, and constructing forest roads, trails, telephone lines, lookout stations, camps and other permanent improvements; locating and developing systems of improvement; costs of construction and maintenance. The course considers improvements for administration and protection rather than for logging or other exploitation. Two lectures and field work. *Two hours.* Assistant Professor LOVEJOY.
6. Silvics. Continuation of Course 5. Three lectures and one laboratory or field period. *Three hours.* Professor SPONSER.
Prerequisite, Forestry 5. Botany 26 must precede or accompany the course.
8. Forest Mensuration. Continuation of Course 7. Two lectures and two field periods. *Four hours.* Mr. YOUNG.
Prerequisite, Forestry 7.
10. Silviculture. Artificial reproduction; seed bed and nursery work. Forest woodlot, and windbreak planting. Afforestation. Prerequisite, Forestry 9. Three lectures and two laboratory periods. *Four hours.* Professor SPONSER.
12. Forestry Problems. Continuation of Course 11. *Two, three, or four hours.*
14. Utilization. Continuation of Course 13. Prerequisite, Forestry 13. *Three hours.* Assistant Professor LOVEJOY.
16. Forest Management. Continuation of Course 15. *Two hours.* Professor ROTH.
Prerequisites the same as for Course 15 and including Forestry 15.
18. Forest Administration. Methods of handling large forest properties with special reference to national and state forests. Organization and conduct of forest business, administrative details of personnel, inventory of resources, records, handling of sales of products, grazing, reforestation, seed collection, usual legal procedures and special forest investigations. *Two hours.* Assistant Professor LOVEJOY.
Prerequisite, Forestry 15.

20. Seminar. Continuation of Course 19. *Three hours.*
22. Conservation with Special Reference to the Forest Resources of the United States. Extent and location of our forests; standing supplies of timber; the cut of timber and its distribution; forest influences; general methods of handling forests; forest history and policy in the United States and abroad. The treatment of the subject in general and from the standpoint of public economy. Open to all students. Lectures. *One hour.* Professor ROTH.
24. Forestry for Civil Engineers. Identification, characteristics, methods of storage and treatment of timbers used in construction. Methods of transportation of rough timber. Relation of forests to precipitation and run off of water sheds with special reference to power and storage reservoirs and irrigation projects. Planting for reservoir protection, snow and windbreaks. Special surveys of timber holdings. Methods of securing rights of way and easements across timber holdings. Open to all students. *Two hours.* Mr. YOUNG.
26. Forestry for Teachers. History of science and general economic phases. Ways of identifying common trees, methods of tree planting, tree species desirable for various specific purposes. Lectures, literature and references. Open to all students. *Two hours.* Mr. YOUNG.

COURSES IN OTHER DEPARTMENTS

OPEN, UNDER CERTAIN CONDITIONS, TO STUDENTS IN THE DEPARTMENT OF LITERATURE, SCIENCE, AND THE ARTS

The following courses, given in other Departments of the University, may, in certain cases, be elected by students in the Department of Literature, Science, and the Arts. For the conditions of such election, see the preliminary statements under the various headings below, or consult the Registrar of the Department of Literature, Science, and the Arts.

Students in this Department may elect courses in other Departments of the University only by special permission of the Dean of this Department. Such permission is granted *pro forma* to students enrolled in programs (Business Administration, Forestry, etc.), whose curricula include courses outside the Department. But students who relinquish such special programs forfeit the credit for extra-Departmental courses they may have taken.

DRAWING

All work in Drawing is given in the Engineering Buildings. Room 31 is in the Old Building. Rooms 407, 420, 421, 436, 437 are in the New Building. In regard to Courses 1, 4, 4a, 5a, 10, 11, 21,

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22, 23, 24, 25, 26, 27, 28, 30, 33, and 35, see also the Special Announcement of the Department of Engineering. Courses 1 to 11 may be elected without special permission.

FIRST SEMESTER

1. Geometrical Drawing. *Four hours.* Mr. ABBOTT.
2. Free-Hand Drawing. Application of the laws of perspective, light and shade, in the free-hand representation of form, by the use of pen and pencil. A general preliminary course. *Two hours.* Miss HUNT.
Sections are limited in number to 30 students.
4. Descriptive Geometry. Recitations and Drawing. *Four hours.* Ten sections. Mr. FINCH, Mr. MILLER, Mr. ABBOTT, Mr. KRISTAL, Mr. FOX, and Mr. HOEXTER.
- 4a. Descriptive Geometry and Shades and Shadows. *Four hours.* Professor GOULDING.
8. Water Color Drawing. Advanced Composition and Still Life. *Two hours.* Miss HUNT.
The section is limited in number.
Course 8 must be preceded by Courses 2, 3, and 7.
9. Historic Ornament and Applied Design. *Two hours.* Miss HUNT.
10. Free-Hand Lettering. *Two hours.* Mr. BENNETT.
12. Statistical Charting. *Two hours.* Mr. FOX.
The following courses in free-hand drawing are required of architectural students, but may be elected by others:
21. Free-Hand Drawing. *Two hours.* Mr. BENNETT.
22. Free-Hand Drawing. *Two hours.* Mr. BENNETT.
23. Free-Hand Drawing. *Two hours.* Mr. EVERETT and Mr. BENNETT.
24. Free-Hand Drawing. *Two hours.* Mr. EVERETT and Mr. BENNETT.
25. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
26. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
27. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
30. Water-Color Drawing. *Two hours.* Mr. EVERETT.

SECOND SEMESTER

1. Geometrical Drawing. *Four hours.* Mr. ABBOTT.
3. Free-Hand Drawing (Advanced). Work from casts and still life in black and white. Rendering with charcoal, brush, and pencil. *Three hours.* Miss HUNT.
Course 3 must be preceded by Course 2 or an equivalent.
4. Descriptive Geometry. Recitations and Drawing. *Four hours.* Ten sections. Professor GOULDING, Mr. FINCH, Mr. ABBOTT, Mr. KRISTAL, Mr. FOX, and Mr. HOEXTER.
- 5a. Advanced Projections and Stereotomy. *Two hours.* Professor GOULDING.

7. Water-Color Drawing. Elementary drawing and coloring from copy. *Two hours.* Miss HUNT.
Course 7 must be preceded by Course 2.
- 9a. Historic Ornament and Applied Design. (Continued.) *Two hours.* Miss HUNT.
10. Free-Hand Lettering. *Two hours.* Mr. BENNETT.
12. Statistical Charting. *Two hours.* Mr. FOX.
The following courses in free-hand drawing are required of architectural students, but may be elected by others:
21. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
22. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
23. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
24. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
25. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
26. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
28. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
30. Water-Color Drawing. *Two hours.* Mr. EVERETT.
33. Clay Modeling. *Two hours.* Mr. EVERETT.
35. Pen and Ink. *One hour.* Mr. EVERETT.

ARCHITECTURE

For other courses in Architecture see the Announcement of the Department of Engineering.

Course 15 may be elected without special permission.

FIRST SEMESTER

11. History of Architecture: Ancient. The buildings of Egypt, Assyria, Persia, Greece, and Rome. The historical conditions, building materials and methods, planning and design, and the sculptured and painted decoration and ornament of architecture will be studied by means of illustrated lectures, conferences, drawing exercises and research. *Two hours.* Mr. KIMBALL.
13. History of Architecture: Medieval and Renaissance. The Gothic Architecture of France, England, Germany, Italy, and Spain, and the Architectural Work of the Early Renaissance in Italy. Illustrated lectures, conferences, drawing exercises, and research. *Two hours.* Assistant Professor ROBINSON.
15. General Course in the History of Architecture. *Two hours.* Mr. KIMBALL.

The aim of this course is to give students seeking a liberal culture a survey of the development of the art of building. The temples, cathedrals, palaces and other characteristic monuments of the ancient, medieval, renaissance and modern styles, their design, sculpture and painted decorations will be studied by means of lectures illustrated by the stereopticon, and collateral reading. This course is open to all students in the University, but cannot be counted towards graduation in architecture.

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For students of art and archæology desiring a more intensive study of the evolution of architecture. Courses 11, 12, 13, and 14 are recommended.

SECOND SEMESTER

12. History of Architecture: Mediæval. The Early Christian, Byzantine and Romanesque Architecture of Italy, Byzantium, Central Syria, France, and Germany, and Sassanian and Mohammedan Architecture. The historical conditions, building materials and methods, planning and design and the sculptured and painted decoration and ornament of architecture will be studied by means of illustrated lectures, conferences, drawing exercises and research. *Two hours.* Assistant Professor ROBINSON.
14. History of Architecture: Renaissance and Modern. Architectural Monuments during and since the Renaissance in Europe and Architecture in the United States. Illustrated lectures, conferences, drawing exercises, and research. *Two hours.* Assistant Professor ROBINSON.

SHOP PRACTICE

SECOND SEMESTER

5. Instrument Making. *Two hours.*

MECHANICAL ENGINEERING

24. Prime Movers. *Three hours.*

This course is offered primarily for Forestry students. It embraces a study of the steam engine, gas engine, and water turbine, together with the study of the various methods of transmitting the power from these prime movers. This subject is covered in a popular way and in addition, attention is given to the operation of the various machines.

This course should be preceded by Courses 1 and 2 in Physics.

DEPARTMENT OF MEDICINE AND SURGERY

The following courses given in the Department of Medicine and Surgery, are open to students in the Department of Literature, Science, and the Arts who receive special permission from the Dean of the latter Department. They may not be counted towards the ninety (or sixty) hours of Literary credit required on the Combined Literary and Medical Course.

PHYSIOLOGY

The courses in Physiology are arranged for those who intend to become physicians or dentists, those who propose to teach the subject, and those who contemplate making biology, physiology, or psychology a specialty.

Instruction is given by lectures, demonstrations, recitations, informal discussions, and laboratory work. In the laboratory the student learns to use the apparatus and methods employed in ordinary physiological experiments, and personally observes the principal facts of physiology. Advanced students are given an opportunity to begin research work.

Courses 1 and 2 should be preceded by courses in general biology, anatomy, histology, physics, and chemistry.

Literary students take Physiology with the Medical or Dental students. Courses 1 and 2 form one continuous course, the work being begun on March 1 as Course 1 in the second semester and continued as Course 2 in the first semester of the following year. Course 1a, given primarily for Dental students, covers the entire subject, in a somewhat more elementary fashion, in a single semester. This course is the preferable one for literary students who propose to teach or who desire a general knowledge of the subject. No credit is given for this course in the Medical Department.

The laboratory work of Course 3 is given in two sections, and may be elected the first half, or second half of the first semester. This course is open only to students who have taken Course 1, or have had equivalent work.

FIRST SEMESTER

2. Lectures and Recitations. Continuation of Course 1. *Five hours.* Professor LOMBARD.
3. Laboratory Work. *Three hours.* Daily for eight weeks. Professor LOMBARD, Dr. COPE, and assistants.

SECOND SEMESTER

1. Lectures and Recitations. *Four hours.* Professor LOMBARD.
 - 1a. Lectures, Demonstrations, Recitations. *Five hours.* Dr. COPE.
 4. Physiological Experimentation. Teachers' course. *One hour.* Professor LOMBARD.
 5. Research Work. *Three hours.* Professor LOMBARD.
- This course is open to those who have taken Course 3.

ANATOMY

The courses in Anatomy are open to students taking the combined literary and medical course. Other students may take these courses by special permission from the Director of the Anatomical Laboratory and the Dean of the Department.

GIVEN EACH SEMESTER

1. Anatomy of the Arm and Leg. Laboratory and reading. *Four hours.* Professor STREETER and assistants.
2. Anatomy of the Abdominal and Pelvic Viscera. Laboratory and reading. *Four hours.* Professor STREETER and assistants.
3. Anatomy of the Head, Neck and Thorax. Laboratory and reading. *Four hours.* Professor STREETER and assistants.

4. Conferences in Anatomy. Recitations and demonstrations, supplementary to Courses 1, 2, and 3. Professor STREETER, and Dr. MCGARRY.
5. Regional and Topographical Anatomy. Laboratory and recitations. Dr. MCGARRY.
9. Anatomy of Nervous System and Special Sense Organs. Comparative and Embryological. Laboratory and reading. Professor STREETER.
10. Original Investigation in Problems of Vertebrate Morphology. Laboratory and reading. Professor STREETER.

HISTOLOGY AND EMBRYOLOGY

The work in Human Histology and Embryology is conducted in the laboratory of Histology and Embryology, in the Medical Building.

FIRST SEMESTER

1. Embryology, Histogenesis, General Histology, Organology and Anatomy of the special sense organs and the nervous system. Lectures, recitations, demonstrations and laboratory work. *Seven hours.* Professor HUBER, Mr. KOCH. and assistant.
2. Methods and Laboratory Technique in Histology and Embryology. *2a, two hours; 2b, three hours.* Professor HUBER.
3. Embryology and Microscope Anatomy of the Central Nervous System and Special Sense Organs of Man. Laboratory work and reading. Elected as *3a, three hours; 3b, five hours.* Professor HUBER.
4. Research Work in Vertebrate Histology and Embryology. Professor HUBER.

SECOND SEMESTER

2. Methods and Laboratory Technique in Histology and Embryology. May be elected as *2a, two hours; 2b, three hours.* Professor HUBER.
3. Embryology and Microscopic Anatomy of the Central Nervous System and Special Sense Organs of Man. Laboratory work and reading. May be elected as *3a, three hours; 3b; five hours.* Professor HUBER.
4. Research Work in Vertebrate Histology and Embryology. Professor HUBER.

PHYSIOLOGICAL CHEMISTRY, BACTERIOLOGY, AND HYGIENE

The courses in these subjects, given by Professors VAUGHAN and NOVY, are arranged for the most part to meet the wants of students in the Department of Medicine and Surgery, and of students who propose to study medicine in the future.

Course 1 may be elected without special permission.

FIRST SEMESTER

- 3a. Practical Bacteriology. This course is the same as Course 3 and is open to students other than those entitled to Course 3. *Four hours.* Professor NOVY and assistants.
5. Water Analysis. Laboratory work. *Three hours.* Professor VAUGHAN.
6. Food Analysis. Laboratory work. *Credit to be arranged.* Professor VAUGHAN.
7. Research Work. *Credit to be arranged.* Professor VAUGHAN or Professor NOVY.
8. Physiological Chemistry. Lectures. *Three hours.* Professor VAUGHAN.
9. Physiological Chemistry. Laboratory work. *Three hours.* Professor NOVY and Mr. LUDLUM.
10. Advanced Physiological Chemistry. Laboratory work. *Three hours.* Professor NOVY and Mr. LUDLUM.

SECOND SEMESTER

1. General Hygiene. Lectures. *Three hours.* Professor VAUGHAN.
 2. General Bacteriology. Lectures. *Five hours.* Professor NOVY.
 3. Practical Bacteriology. Professor NOVY and assistants.
 4. Bacteriology. Special methods. Laboratory work. Professor NOVY.
- Course 4 must be preceded by Course 3.
- 4a. The Pathogenic Protozoa. This course must be preceded by Course 4. Laboratory work. Professor NOVY.
 5. Water Analysis. Laboratory work. *Three hours.* Professor VAUGHAN.
 6. Food Analysis. Laboratory work. *Credit to be arranged.* Professor VAUGHAN.
 7. Research Work. *Credit to be arranged.* Professor VAUGHAN or Professor NOVY.
 10. Advanced Physiological Chemistry. Laboratory work. *Three hours.* Professor NOVY and Mr. LUDLUM.

PHARMACOLOGY

SECOND SEMESTER

1. Pharmacology. Lectures and recitations. *Three hours.* Professor EDMUNDS.
 3. Experimental Pharmacology. Laboratory work. *Three hours.* Professor EDMUNDS and Dr. MARSHALL.
- This course consists in the investigation of the effects of chemical agents (drugs and poisons) on living animals and tissue, and embraces the examination of the symptoms induced and their explanations on the basis of physiology and chemistry. This course may be taken only with permission of the instructor.

DEPARTMENT OF LAW

Courses in the Department of Law may be taken by students in the Department of Literature, Science, and the Arts to count toward the Literary degree only in so far as prescribed or part of the courses in Business Administration or Forestry. Courses in Law may not be counted toward the ninety-two hours of Literary credit required on the Combined Literary and Law Course.

The Committee on Courses in Commerce has published an Announcement of courses in the Department of Law which may be elected by candidates for the Commercial Certificate.

For the schedule of instructors, rooms, days, and hours, see the Announcement of the Department of Law.

ROMAN LAW AND JURISPRUDENCE

The courses in Roman Law are closely associated with the work in Latin. Course 1 or 10 is required of candidates for a doctor's degree in Latin, with a minor in Roman Political Institutions. Either of the courses may be taken with profit by the student of Latin who is also interested in history or law.

FIRST SEMESTER

1. Roman Private Law. The History and Fundamental Principles of Roman Private Law. *Two hours.* Professor DRAKE.

SECOND SEMESTER

10. The Science of Jurisprudence. *Two hours.* Professor DRAKE.

For other courses in Law subjects see the Announcements of the Department of Law.

FEES AND EXPENSES

Every student, before entering any Department of the University, is required to pay a matriculation fee, which for a citizen of Michigan is ten dollars, and for a person who comes from any other state or country twenty-five dollars, is paid but once, and entitles the student to the privilege of permanent membership in the University. In addition to the matriculation fee, every student has to pay an annual fee for incidental expenses. This fee is paid the first year of residence at the University and every year of residence thereafter. The annual fee in the Department of Literature, Science, and the Arts is for Michigan students, forty-two dollars; for all other students, fifty-two dollars.

Persons engaged in teaching in public, parochial, or private schools who are regularly admitted as students in the Department of

Literature, Science, and the Arts, may elect not more than five hours a week, upon the payment of a fee of ten dollars in lieu of the regular annual fee. Such students must pay the matriculation fee the same as other students.

A fee of ten dollars is charged for graduation. No student is recommended for a degree until he has paid all fees, including the fee for graduation. A fee of two dollars is charged for the Teacher's Diploma.

Students who pursue laboratory courses are required to pay for the materials and apparatus actually consumed by them. The deposits required in advance range from one to twenty dollars. In the chemical laboratory the average expense for each course is about one dollar and twenty cents a week. For the rental of a locker in the Gymnasium a fee of two dollars is charged for men, one dollar for women.

There are no dormitories and no commons connected with the University. Students obtain board and lodging in private families for from three and a half dollars to six dollars a week. Clubs are formed in which the cost of board is from three dollars to four dollars and a half a week. Room rent varies from seventy-five cents to two dollars and a half a week for each student. The annual expenses of students, including clothing and incidentals, are, on the average, about four or five hundred dollars. There are always among the students a number who defray their expenses, at least in part, by their own efforts. The University does not, however, undertake to obtain employment for students.

Departments of Engineering and Architecture

Special Announcements giving further information in regard to these Departments are published annually. For copies of these Announcements or for other information relating to the Departments, address Professor Mortimer E. Cooley, Dean of the Departments of Engineering and Architecture, or Professor Emil Lorch, Professor of Architecture, Ann Arbor, Mich.

In the legislative act under which the University was organized in 1837, provision was made for instruction in engineering and architecture. Work was not actually begun in engineering, however, until 1858, and the first degrees were conferred in 1860. The engineering courses were included in the curriculum of the Department of Literature, Science, and the Arts, until the close of the collegiate year, 1894-1895. At that time the Department of Engineering was established by the Board of Regents as a separate Department of the University. Instruction in architecture was organized as a sub-department of the Department of Engineering in 1906. In 1913 the Department of Architecture was given control of its courses of study, and, in general, charged with the administration of its affairs.

The Department of Engineering offers a group of four year courses leading to the bachelor's degree. The degree conferred upon completion of one of these courses is Bachelor of Civil, Mechanical, Electrical, Chemical, or Marine Engineering. The degree conferred upon com-

pletion of one of the four year courses in the Department of Architecture is Bachelor of Architectural Engineering or Bachelor of Architecture.

The requirements for these degrees will be found on page 339.

Beginning with June, 1916, the only degree conferred will be Bachelor of Science in Engineering and Bachelor of Science in Architecture.

The academic year extends from the Tuesday preceding the first Thursday in October to the last Thursday in June (September 29, 1914, to June 24, 1915). In addition to this, attendance at a Summer Session of eight weeks, beginning the Monday after Commencement (June 29 to August 21, 1914) is required between the first and second years of residence for students in Architecture, in groups I and III; between the second and third years for all others except those in Civil Engineering; and between the third and fourth years for students in Civil Engineering.

DEPARTMENT OF ARCHITECTURE

Three four year courses or programs of study are offered. In each of these provision is made for the essentials of a liberal education,—language, mathematics, science, and fine arts,—for cultural electives, and for as much specific training in drawing, architectural design and history, construction, and building equipment as seems permissible during a period of four years.

Program I provides a general course; in Program II, architectural design receives greater emphasis; while in Program III, advanced construction and the mechanical equipment of buildings are given a relatively large amount of time, particularly during the fourth year. The first year is practically identical for the four year programs while the students in all these groups share the same classes in architecture during the first three years.

There is also a two year course for special students open under certain conditions to experienced architectural draftsmen; college graduates may also enter as special students.

REQUIREMENTS FOR ADMISSION

The requirements for admission are at present the same for all students in Engineering and Architecture.

Applicants for admission must be at least sixteen years of age, and must present satisfactory evidence of good moral character. They must bring credentials from the preparatory school last attended.

Applicants may be admitted on diploma, by examination, or on credits from another college. Advanced credit is allowed for work done in other institutions, provided the applicant's record shows that such work is equivalent to some course or courses offered in the University of Michigan. Provision is also made for the admission of special students under certain conditions.

ADMISSION OF CANDIDATES FOR A DEGREE

Candidates for admission as regular undergraduate students must pass examinations in fifteen units as indicated below or must be recommended by an accredited preparatory school as graduates who have satisfactorily completed these requirements for admission. Students who otherwise meet the above requirements but are deficient in not more than one and one-half units, may be admitted conditionally, but must make up their deficiencies within one year. These requirements are stated in units, a unit meaning the equivalent of five recitations a week for one year in one branch of study. Two hours of laboratory, drawing or shop work are counted as equivalent to one of recitation.

Prescribed Units for Admission

English	3 units
Grammar, Composition, Classics, History of English Literature.	

Mathematics	3 units	
Algebra, through quadratics.		
Geometry, Plane, Solid, Spherical.		
Physics	1 unit	
History	1 unit	
Greek, Latin, German, French, Spanish—One of these	2 units	
Chemistry	1 unit	} Of these $1\frac{1}{2}$ or 2 units.
Trigonometry, Plane.....	$\frac{1}{2}$ unit	
French or German.....	1 or 2 units	
Greek or Latin.....	1 or 2 units	
Manual Training	1 unit	
<hr/>		
$11\frac{1}{2}$ or 12 units		

The Manual Training accepted for this unit must be of such a character as to excuse the student from Shop 1 in the University. Students who present the full requirements for admission without Chemistry or Trigonometry, will take a two hour course in Trigonometry and two four hour courses in Chemistry during their first year of residence, receiving credit for the same toward graduation.

The remaining 3 or $3\frac{1}{2}$ units may be presented in any subjects for which credit toward graduation is given by the accredited school and which are taught in a manner approved by the University; but no more than three of the fifteen units required for admission will be accepted in vocational subjects and no more than two units in any one vocational subject. Students who plan to pursue the study of Architecture, should aim to present drawing, preferably free hand drawing, for admission.

All applicants must send prospectuses of the courses of study or letters from instructors describing the work done when credit is asked in the vocational subjects,—Manual Training, Drawing, Agriculture, and Commercial Branches. In general, the standards set up by the Commission on Accredited Schools and Colleges of the North Central Association of Colleges and Secondary Schools will be recognized in adjusting high school credits in vocational studies.

Chemistry and Plane Trigonometry are placed in an alternative group with German, French, Latin, Greek, and Manual Training, so that all high schools with three or more teachers may offer full preparation for the Engineering and Architectural Departments, even if they cannot teach Chemistry and Trigonometry. These courses are offered in the Summer Session to accommodate students who wish instruction in them before entering the Departments.

Some modifications of the language requirements may be allowed in the case of students whose native tongue is other than English. These cases will be considered individually.

Under English is included Grammar, Composition, Reading of English Classics, and History of English Literature. The History

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of English Literature may form part of the work of either the third or fourth year. Four units in English should always be presented whenever it is possible to do so.

New Language Requirement for Graduation

All students of both Departments are required to complete the equivalent of Course 4 in French or German, as given in the Engineering Department, or the equivalent of Course 2 in Spanish, if preceded by at least three units of Latin or Greek. If a student completes this requirement with less than a total of six units (twenty-four hours) in language, counting both the work done in the preparatory school and University, he may substitute for the balance courses chosen from the following list:—

English, Foreign Languages, Oratory, History, Political Science, Political Economy, Sociology, Philosophy, Fine Arts, Music.

ADMISSION ON DIPLOMA

Students presenting graduation certificates from any of the schools officially approved by the Committee on Diploma Schools, are admitted without examination to the Departments of Engineering and Architecture, if they are recommended by the principal of the school in the subjects required as units for admission. Students must have done their work in mathematics and physics recently enough to have these subjects thoroughly in mind if they are to enter and do the work required in either Department. These studies may be reviewed in the Summer Session, June 29 to August 21, 1914. College credit may be given for studies presented in excess of the fifteen units required for admission, if these studies are deemed equivalent to similar courses in the University. Such credit will be adjusted after consultation with the professor in charge of the department concerned.

The approved schools of the University of Michigan do not necessarily include all of those accredited to or affiliated with other universities or colleges.

Diplomas and seventy-two-count academic certificates issued by the Regents of the University of the State of New York are accepted by the Departments of Engineering and Architecture in place of ex-

aminations in all the subjects required for entrance which are covered by such credentials, provided that not more than fifteen months have elapsed since graduation. A statement from the teacher, giving in detail the work done and proficiency attained in these subjects, must be submitted by the holder of the credentials.

Any student who for any reason has failed to secure a certificate of graduation from an approved school and the principal's recommendation will be required to pass the regular examinations for entrance in all subjects.

Those desiring to enter the Department of Engineering on diploma should present their credentials at the office of the Assistant Dean, Room 255, New Engineering Building; in case of the Department of Architecture, these credentials should be presented to the Professor of Architecture, Room 209 of the same building; not later than September 23 or 24, if desiring to enter the first semester, or February 3, if desiring to enter the second semester. It is better to mail the credentials to the proper officer as long before these dates as practicable. They will be examined, placed on file, and the applicant will be informed whether they satisfy the requirement or not. Certificates and diplomas from schools other than those officially approved by the University do not excuse an applicant from the admission examinations.

ADMISSION ON EXAMINATION

Examinations for admission are held in September and in February. These examinations are conducted by the Department of Literature, Science, and the Arts, in accordance with the schedule on page 111. Applicants presenting themselves too late for the scheduled examinations are required to pay an examination fee of *five dollars*.

SCOPE OF THE PREPARATORY WORK

In English Language, English Literature, French, German, Greek, Latin, Physics, Chemistry, History, Physiography, Botany, and Zoology the amount and character of the work which will be accepted is indential with that described for the Department of Literature, Science, and the Arts.

Mathematics.—The three and one-half units in mathematics include algebra, geometry, and trigonometry, as follows:—*Algebra.*—Fundamental Rules, Fractions, Simple Equations, Involution and Evolution, the theory of Exponents, and Quadratic Equations, as given in Beman and Smith's *Elements of Algebra*, or an equivalent in other authors.

Geometry.—Plane, Solid and Spherical Geometry as given in Beman and Smith's *Plane and Solid Geometry*, or an equivalent in other authors.

Trigonometry.—Plane Trigonometry, as given in Hall and Frink's *Trigonometry*, or an equivalent in other authors.

N. B.—It is very desirable that High Schools whose graduates are received on diploma arrange their courses so as to include a portion of both Algebra and Geometry in their last preparatory year. Students who do not come from diploma schools should take a similar review if they expect to succeed in the study of mathematics in the University.

Spanish.—In addition to covering thoroughly the subject of Spanish grammar as is presented in such a work as Wagner's *Spanish Grammar*, the student should have read considerable modern Spanish and be able to read at sight easy prose. The preparatory course should include daily practice in conversation.

Drawing.—Where the full two units are offered for admission the work may consist of free-hand drawing, mechanical drawing, and design, a combination of any two of these, or it may consist entirely of any one of the three. Each one-half unit offered must represent work extending through the equivalent of two forty-five minute periods per day for one-half year.

The work to be covered in the first one-half unit allowed is stated below. To receive the additional one-half, one, or one and one-half units the work must be relatively more advanced and the student must present a separate outline of each course taken together with the drawings made.

1. *Free-hand Drawing.*—The student should show that he can represent correctly in outline and in light and shade, geometric and simple natural or decorative form. Accuracy of proportion and perspective are essential. The pencil, charcoal, or brush may be used.

2. *Mechanical Drawing.*—This work should cover:

(a) Exercises giving evidence of skill in the use of instruments and knowledge of materials used. These should consist mainly of the accurate geometrical construction of the more important plane curves, with simple problems involving tangents and normals to the same.

(b) Graded exercises in the orthographic projections of simple geometrical forms and working drawings of some of the more elementary constructions in wood and metal, all fully dimensioned, and in which the conventional signs are properly used.

(c) Exercises in line shading, shade lining, and cross hatching, together with a reasonable skill in lettering.

3. *Design*.—In this work a student should demonstrate some knowledge of the principles of design and the ability to apply them. The exercises should consist of compositions of straight and free curved lines and simple shapes and their use in the design of simple objects, such as a book cover, etc. The exercises may be in black and white, various values, or in color, and may consist in part of objects executed in wood or metal, and the like.

Manual Training in Shop Work.—One unit. Optionally prescribed. The work to be accepted for this unit must cover bench work in wood, wood turning and simple pattern making; forging, chipping and filing; elementary machine shop work.

Two units. Allowed. In making up the two units allowed, not more than one unit will be accepted in wood work, wood turning, and pattern making; one unit in machine shop work; one-half unit in forge shop work; one-half unit in foundry.

Agriculture and Commercial Branches.—In general the requirement for a unit in Agriculture or in Commercial Branches involves the completion of a course taken at least five hours per week for one year and accepted for graduation in the high school. The extent and character of the work must be approved by the inspector of the University.

CONDITIONAL ADMISSION

An applicant who is deficient in not more than one and one-half units, may, at the discretion of the Faculty, be admitted conditionally; but any condition thus incurred must be removed at one of the next two regular examinations for admission, and no student who has an admission condition outstanding at the beginning of his second year of residence is allowed to enter his classes until such condition is removed, unless for valid reason an extension of time is granted for its removal.

ADMISSION ON CREDITS FROM ANOTHER COLLEGE

Applicants who have taken some portion of the studies required for admission in an approved school or college—not a high school—may receive credit for such work in place of taking examination in the same. The following documents must be presented:

a. An official copy of their credits showing the subjects studied in such school or college, the number of weeks devoted to each, the number of class periods per week, and the standard attained upon completing the same.

b. An official certificate of their regular admission to such school or college.

c. An official certificate of honorable dismissal from such school or college.

Applicants in Engineering should apply in person to the Assistant Dean, Room 255, New Engineering Building, and applicants in Architecture to the Professor of Architecture, Room 209, New Engineering Building, September 23 or 24, or February 3, or their documents may be sent on in advance at the earliest possible date.

ADMISSION TO ADVANCED STANDING

Bachelors of Arts of this University (and graduates of other approved colleges) are admitted without examination to advanced standing as candidates for a degree in engineering or architecture.

They should present to the Assistant Dean or to the Professor of Architecture an official certificate of the date of their graduation—not their diploma—and an official copy of the record of the studies they have completed, showing the subjects studied, the number of weeks devoted to each, and the number of class periods per week.

Such students are excused from a considerable portion of the general requirements for graduation (see page 339). The remaining requirements can be completed in two years, if, as an undergraduate, the student has taken the Mathematics and Physics prescribed for engineering students (see page 339), and Course 4 in Drawing (see page 319). A knowledge of differential

and integral calculus, analytical mechanics, elementary drawing and descriptive geometry is required for the advanced work.

The culture imparted by classical or other liberal training will be found to have its uses for one engaged in technical work, and previous discipline of the faculties in exact research will enable the professional students to master more easily the requirements of the course. All the time the student can devote to general studies before taking up specialties will be well spent.

Students who have completed at least one year's work in an approved college, and who bring explicit and official certificates describing their course of study and scholarship, and testifying to their good character are admitted to advanced standing without examination except such as may be necessary to determine what credit they are to receive for work done in the college from which they have come.

Such applicants should present a letter of honorable dismissal from college; an official copy of their college record; and an official record of their high school, or other work, preparatory for college, the same as those admitted on diploma.

Students who have not completed a year's college work in an approved college, but before entering these Departments of the University have pursued studies beyond those required for admission, may be admitted to advanced standing on passing the regular entrance examinations, and examinations in such undergraduate studies as they may ask to be credited with in advance.

Work in manual training and drawing, pursued in a high school, is recognized for advanced credit if considered by the instructors in the Departments of Engineering and Architecture equivalent to the work given in this University. Students desiring advanced standing in

drawing must bring all drawings completed previous to entrance.

Advanced credits must be secured and the record returned to the Assistant Dean or the Professor of Architecture by the date named on the blank form issued by them for such record. An account once closed cannot be reopened without special permission. Application should be made to the Assistant Dean or to the Professor of Architecture.

ADMISSION OF STUDENTS NOT CANDIDATES FOR A DEGREE

Students who are pursuing work in these Departments and are not candidates for a degree, are designated Special Students.

Students over twenty-one years of age who wish to pursue particular studies in either Department and who show by examinations or by the presentation of satisfactory certificates that they are prepared to do good work in the selected courses, may be admitted as special students on the recommendation of the heads of the departments in instruction in which they wish to study. The object of this rule is to enable young men who are beyond the high school age to secure technical training along special lines when they are properly prepared for the work. Two or more years of successful experience as teacher, draftsman, surveyor, engineer, or operative in engineering works, will be given considerable weight in determining the fitness of the candidate. In general, a good working knowledge of English, algebra and geometry is required in order to succeed in engineering studies. Applicants for admission as special students should send as early as possible to the head of the department concerned letters of recommendation, certificates of scholarship and an exact statement of the courses desired.

A two year course is provided for special students in Architecture. Such students must be qualified for the courses they wish to pursue and must have the approval of the head of the Department of Architecture. They must be twenty-one years of age, must have had two or more years of experience in architects' offices, and must have a practical knowledge of architectural drawing. Special students who wish to pursue courses in advanced building construction must present the regular entrance requirements in mathematics.

Special students pay the same fees as regular students. Their work is assigned and regulated by the heads of the departments of instruction in which they register.

A special student may become a candidate for a degree by fulfilling the regular requirements for admission.

A student who is a candidate for a degree cannot become a special student without the permission of the faculty concerned.

DIRECTIONS

Applicants for admission on examination should present their credentials to the Assistant Dean of the Departments of Engineering, Room 255, in the New Engineering Building or to the Professor of Architecture, Room 209, New Engineering Building, on Monday, September 21, between the hours of 9 and 5, and receive from him papers admitting to the examinations. The result of the examination may be learned at the office of the appropriate officer, Monday, September 28.

Applicants for admission on diploma should present their recommendation blanks to the Assistant Dean or the Professor of Architecture not later than September 28, 1914.

When admitted, each student will be furnished with a folder containing directions for subsequent procedure.

WITHDRAWAL FROM THE DEPARTMENTS

Before withdrawal from class work, even temporarily, students should report to the Assistant Dean or the Professor of Architecture.

Honorable Dismissal will be granted by the Assistant Dean or the Professor of Architecture to students whose records are clear.

RULES GOVERNING PARTICIPATION IN PUBLIC ACTIVITIES

For the rules governing participation in public activities, see page 83.

FACILITIES FOR INSTRUCTION IN ENGINEERING

The chief requirement for a successful school of engineering is recognized to be a teaching staff organized by the selection of men who have not only had a thorough technical training but who have engaged for a considerable period in the practice of the particular branch of engineering which they teach. A large number of men have accordingly been selected, who have been engaged in practice for many years.

The work of instruction offered by these men is supplemented by illustrative material of various kinds. Large collections of photographs, drawings, working drawings, blue prints, models, working models, and full sized machines have been made and are freely used. These collections are being added to largely from year to year by gift and purchase, and are invaluable to the student.

The Department occupies four buildings on the campus, and a portion of the new chemistry building is given over to the work in chemical engineering. The New Engineering Building occupies a ground space equivalent to 60 ft. by 650 ft., and is a fireproof structure four stories high. The Old Engineering Building is used by the Department for the work in English and Modern Languages. The shops occupy the old mechanical laboratory building and the surveying department is temporarily housed in the frame buildings adjoining the New Engineering Building.

PHYSICAL LABORATORY

For description of Physical Laboratory see page 62.

CHEMICAL LABORATORY

For description of Chemical Laboratory see page 63.

ENGINEERING SHOPS

The engineering shops are in a group of connected buildings, and occupy about 30,000 square feet of floor space.

The *Wood and Pattern Shop*, 40 by 127 feet, is equipped with the tools and machinery usually found in a first-class establishment. One end of the shop contains work-benches and tools needed for hand work in wood. The other end contains benches and tools specially adapted for pattern-making. The central portion is occupied by a good variety of wood-working machinery, consisting of large and small wood surfacing machines, circular and band saws, eighteen turning lathes, two wood trimmers, and other smaller machines and devices. A large exhaust fan and pipes convey all shavings and wood cuttings from the machines, benches, and floors to a receptacle in the yard. A lumber and pattern loft, 40 by 120 feet, contains blue-printing apparatus, materials, and a large collection of patterns made by students.

The *Foundry*, 30 by 120 feet, is equipped with cupola and brass furnaces, core-ovens, elevator, crane, blowers, molding machines, and a supply of small tools and flasks suitable for the kinds of work done. A ton or more of castings are made weekly for University purposes. A large storage shed in the yard contains bins or compartments each capable of holding car load lots of pig iron, coke, sand, and scrap iron, used by the foundry.

The *Forge Room*, 40 by 127 feet, contains twenty-eight modern down-draft forges, together with anvils and tools for doing all kinds of work in hand forging, machinery for forging by mechanical process and for working structural shapes in iron and steel. In addition there are benches for hand work in metals, lathes, drills, and planers for elementary machine tool operations, and heat treatment furnaces, pyrometers and hardness testers for giving instruction in modern methods of hardening and tempering steels. Blast is supplied to the fires by a large power-driven fan, and the gases are removed and discharged into a brick stack by an exhaust fan which thoroughly ventilates and purifies the atmosphere of the room.

The *Machine Shop*, 40 by 127 feet, contains a large assortment of high grade machine tools, consisting of 18 lathes, 4 milling machines, 3 planers, 3 shapers, 4 drill presses, grinding machines, a screw machine, and a stamping press; tool, drill, and plain grinders; benches; and a tool room containing a large assortment of small

tools, such as are found in the best machine shops. An overhead trolley transports heavy work and serves the larger machines. An elevator delivers goods to the machine shop from the shop yard. (An air compressor supplies all of the shops with compressed air for various purposes.)

In connection with each of these four shops there is a lecture and quiz room, in which are collected models, drawings, charts, diagrams, and books, which are used in the course of instruction.

The *Instrument Shop*, occupying two rooms 20 by 32 feet and 14 by 30 feet respectively, is equipped with engine lathes, a precision lathe, hand lathes, milling machine, graduating machine, drills, grinders, and other small machines and tools used in constructing scientific and laboratory instruments and apparatus used by the University.

The *Drawing Room*, 30 by 54 feet, is fitted with improved drawing-tables, lockers, and drawing cases for use with classes in workshop drawing and machine design.

The central portion of the building, 32 by 54 feet, contains in the basement a lavatory and locker room, and on the first floor an engine room with a 10 x 20 Reynolds-Corliss engine, a store-room, and the superintendent's office.

A considerable part of the equipment has been designed and built in the shops. New machinery is added from time to time by construction or purchase. The entire equipment is used in instructing engineering and other students in the use of tools for working in wood and metals, and in modern workshop methods. Opportunity is afforded to become familiar with the more common materials and forms of construction used in engineering structures, buildings, and machinery. In all work an effort is made to follow the practice of the best shops.

THE BOGARDUS ENGINEERING CAMP

Camp Davis

Through the generosity of Colonel Charles Bogardus and his wife, Hanna W. Bogardus, the University acquired, in June, 1908, a tract of land embracing about 1,600 acres lying on the south and east shores of Douglas Lake, Cheboygan County, Michigan. The tract has a frontage of about three miles on Douglas Lake. The Surveying Camp (Camp Davis) is located on the southern and eastern shore of Douglas Lake, or on the southern shore of South Fishtail Bay. The University lands extend from Douglas Lake to Burt Lake, one and one-half miles to the south. This furnishes the camp with a frontage on the latter lake, which is advantageous, particularly in connection with triangulation work. Burt Lake, although only a short distance from Douglas Lake, has an elevation of 130 feet less than the latter. The lands adjoining Burt Lake are low and well watered. Numerous springs, probably fed by the waters of Douglas

Lake, appear throughout this area, and some of the waters uniting form a small stream, known as Carp Creek. Course 3 in Surveying was given at this site first, during the summer of 1909. The lands have been improved each year and every class has left some monument to commemorate its activities. A good harbor has been built, two concrete store houses have been erected, and a splendid water system has been installed. Many minor improvements have been made and the university has been benefited greatly by the expenditure of but little money in comparison with the value of the works constructed. The character of the surveying work is described (page 321) in connection with all courses offered in this branch of engineering. While the camp is conducted on a practical basis and while prescribed duties occupy much of the time, yet the students have opportunity for many activities in addition thereto. They manage the camp mess and administer the sanitary regulations. Short intervals are available for various sports and for exercises about a camp fire during the evenings.

MECHANICAL ENGINEERING LABORATORY

The Mechanical Engineering Laboratory is located in the New Engineering Building, and occupies a total floor space of some 13,000 sq. ft. The laboratory as a whole comprises all the equipment utilized for illustration of the theory involved in Mechanical Engineering work and for both standard and research experimental work. Separate laboratory instruction is given along the lines of Hydraulic machinery and Automobiles and those parts of the equipment applying especially to these divisions are segregated to form the Hydraulic laboratory and the Automobile laboratory of which special mention is made below.

The equipment of the general Mechanical Engineering laboratory consists of steam power machinery and apparatus; internal combustion engines and a gas producer; air compressors; refrigeration machinery; and heating and ventilating apparatus; as well as the auxiliary apparatus for use in testing the various machines. Among the most interesting of the machines may be mentioned a 25 KW Curtis steam turbine; a 20 KW DeLaval steam turbine; several steam engines varying from 10 to 150 H. P.; a 40 H. P. Stirling boiler; two high pressure air compressors delivering air at 2,600 pounds per sq. in.; a 13-ton ice-making plant complete in every respect; a Sirocco fan of latest type; and a complete experimental fan heating system. In addition to the laboratory equipment, the University heating and lighting plant is available for experimental work as are also the plants of the city water company.

Besides the larger machinery the laboratory is equipped with all the necessary and desirable instruments used in testing, such as engine indicators, indicating and recording gages, thermometers, pyrometers, flow meters, weighing apparatus, etc. The instrument room

also contains the standards for calibrating and correcting the various instruments. The laboratory is further equipped with apparatus for use in fuel calorimetry and analysis, and oil testing, suitable to the needs of the mechanical engineer.

While by far the greatest part of the equipment of the laboratory is devoted to the standard tests required in the regular work there is nevertheless a large amount of special apparatus developed for the solution of specific problems.

Hydraulic Laboratory.—This laboratory occupies a space of 40 x 60 ft. on two floors. A canal 4 ft. wide and 14 ft. 6 in. deep conveys water from the naval tank to a well which furnishes the suction supply for the pumps. A 15-inch centrifugal pump geared to a 150 H. P. variable speed motor returns the water through two weighing tanks, each holding 600 cu. ft., to the naval tank. The canal is provided with bulk heads, screens, wiers, and nozzles arranged for various kinds of tests. The naval tank itself is arranged with bulk heads dividing it into basins each 100 feet long, and by means of a sluice in the bottom, connecting with the canal, various arrangements for pumping can be made. Other pieces of apparatus of special interest are a one million gallon duplex pump, a tangential water wheel direct connected to a 100 KW Fairbanks-Morse alternator with excitor and switch board, a large Francis water wheel, and a number of smaller pumps and water wheels.

Besides the above equipment, the two Rees Roturbo pumps of the University fire protection system are installed in the Hydraulic laboratory, each pump being driven by a 150 H.P. variable speed induction motor. These pumps are arranged for use in experimental work.

Automobile Laboratory.—The Automobile laboratory contains four and six cylinder automobile motors, a self-starting system, a complete four-cylinder cut-out chassis, with demonstrating racks of carburetors, magnetos, clutches, transmissions, differentials, pleasure car and truck axles. Prony brakes, water brakes, and a complete Diehl electric cradle dynamometer rated at 60 H.P. for speeds up to 2400 R. P. M., are available for determining power output. These, in connection with fuel measuring devices, pyrometers, cooling water regulating apparatus, compression gages, and a Hospitalier-Carpenter optical manograph, make the laboratory equipment complete for standard tests and advanced research work on automobile motors and chassis.

PHYSICAL TESTING LABORATORY

The Physical Testing Laboratory occupies two adjoining rooms, 29 x 54 feet and 27 x 54 feet respectively, on the ground floor of the south wing of the building and is equipped with apparatus especially designed for testing the strength of materials used in engineering work. This equipment includes a 100,000 pound Olsen testing machine and one of 200,000 pounds capacity built by Riehle Brothers. Both these machines are adapted to tensile, compressive, and trans-

verse tests, and are run by direct-connected electric motors. An Olsen torsion machine of 240,000 inch-pounds capacity, also equipped with direct-connected motor, is used, in determining the torsional strength of shafts and axles. The cement testing laboratory is equipped for making the ordinary tests of cement and concrete. In addition to scales, sieves, briquet molds and accessories, there are two briquet testing machines made by Olsen, and a uniform load beam testing machine, especially designed for the University of Michigan, with a capacity of 85 tons, and adapted to beams of reinforced concrete, wood, or steel of any span up to 12 feet.

HIGHWAY LABORATORY

The Highway Laboratory at present occupies temporarily part of the room of the Physical Testing Laboratory.

The equipment for this work is modern and up to date and is a duplicate of that of the laboratory of the Office of Public Roads of the Department of Agriculture at Washington. A standard rattler for the abrasion test on brick, Deval rattler for the abrasion test on rocks, stone crusher, ball mill, diamond drill, diamond saw and machines for testing hardness, toughness and specific gravity, with full quota of small tools, sieves, scales, etc., complete the equipment.

This laboratory has been placed at the service of the people of the State of Michigan, by the Board of Regents, and tests of brick, stone, and other paving materials will be made without any charge for cities or villages or for highway officials.

SANITARY EXPERIMENT STATION

The Sanitary Experiment Station comprises two small buildings together with a number of minor structures, and is located on the University grounds near Fuller Street, where the slope of the surface permits of the compact and efficient arrangement of the plant. The purpose of the Station is to provide facilities for the study of various problems related to public sanitation, and particularly to afford opportunities for investigational work in water purification, sewage disposal, the prevention of stream pollution, and other fields of sanitary engineering.

For work along the lines of sewage disposal and the protection of streams from pollution, the Station plant includes a large experimental septic tank unit, an Imhoff tank, four units of primary and two units of secondary contact filters, four slate filters, two sand filters, a six-compartment trickling filter, several settling tanks, apparatus for the sterilization of effluents by means of hypochlorite, and other minor and supplementary equipment. All the filters are set out in the open, for the purpose of studying the effect of severe winter weather upon their operation, but the tanks and controlling apparatus and other minor equipment are housed in the main Station building.

ELECTRICAL ENGINEERING LABORATORIES

The electrical engineering laboratories occupy a total area of nearly 12,000 square feet in the New Engineering Building. They are divided into the main dynamo laboratory and adjacent rooms on the ground floor of the north wing and the telephone and telegraph laboratory of several rooms in the west wing and a large space in the attic story of the building. The space in the north wing includes one room 56 x 83 feet for dynamo-electric machinery, one-half for direct current apparatus, the other half for alternating-current apparatus; two rooms, each 20 x 30 feet, for calibration and research work; one room, used as a museum; and five rooms in the basement, three of which are used for photometry, one for a storage battery, and one for a store room. The laboratory also includes an instrument room, a repair shop, and a dark room.

The following brief statement will give an idea of the equipment of the laboratories, a more complete description will be found in the Bulletin of the Department of Engineering.

The *Direct Current Laboratory* has many different types of direct current machines, including series arc light generators, shunt and compound generators for power and light, shunt, compound and series wound motors for various uses, pairs of machines mechanically and electrically coupled for pumping back tests, and a generous supply of voltmeters and ammeters of the best makes. There are also rheostats and lamp banks for use with the machines, and the laboratory has a complete system of switch boards and connecting underground wires. Each machine has its individual parts connected to a small switch board, so that the student must first connect up the parts of the machine before using it. Power is supplied from the University power plant and an ample storage battery.

The *Alternating Current Laboratory* has many machines of various types, including single phase, two phase, and three phase, and a small experimental twelve phase generator. The equipment includes generators, motors, rotary converters, and transformers for both constant potential and constant current. There is a generous supply of voltmeters, ammeters, wattmeters, and other auxiliary apparatus, and the laboratory has a system of switchboards and underground wires, making it possible to connect the various machines. The laboratory is supplied with power from the University power plant, the Eastern Michigan Edison Co., and an ample storage battery. New machines and apparatus are added each year to keep the laboratory up to date.

The direct current and alternating current laboratories have in connection a battery room with 61 cells of 80 amperes capacity (one-hour rating), a calibration laboratory with Kelvin balances, curve tracer, oscillograph, galvanometer, a potentiometer, etc., and an instrument room.

The electrical and mechanical departments have jointly a steam turbine-electric generator set, and the electrical and hydraulic departments have jointly a hydro-electric set.

The *Photometric Laboratory* has three dark rooms fitted with photometers, photometer bars, lamp stands, etc. The general equipment includes a number of the best types of photometers, standard lamps, and auxiliary apparatus for testing various types of arc, incandescent, and vapor lamps, and the testing of the illumination of buildings and streets, and the investigation of shades, and reflectors, and window glass and prisms used to deflect or diffuse light.

The *Telephone and Telegraph Laboratories* are well equipped for the study of telephone and telegraph apparatus of both commercial and experimental types. The auxiliary apparatus includes ammeters, voltmeters, electrodynometers, artificial telephone cables, condensers, etc., and is being added to each year. The laboratories are well supplied with commercial apparatus from the principal telephone companies. The wireless telegraph equipment is able to reach the Atlantic coast or even ships at sea and the laboratory is a wireless telegraph station with an operator licensed by the United States Government. There are excellent facilities for experimenting in wireless work. The Michigan State Telephone Co. operates an exchange for the University in an adjoining room and this is available for demonstration purposes.

The *Museum* contains several dynamos of historic interest, including an early generator by Ladd of London and two by Dr. J. W. Langley, formerly of this University, collections of insulators, cables, and other articles of interest or value for instruction to students in electrical engineering.

The University Power Houses and the electrically driven fire pumps, while not part of the electrical laboratory, as well as the hydro electric power houses and distributing stations of the Eastern Michigan Edison Co. at and near Ann Arbor, on the Huron River, are valuable adjuncts for instruction purposes.

The University is well situated for excursions to Detroit and other places where establishments of engineering interest may be visited.

CHEMICAL ENGINEERING LABORATORY

The Chemical Engineering Laboratory occupies twenty rooms on the first and second floors of the new chemistry building. A laboratory 40 by 50 feet in the southwest corner of the second floor accommodates students whose work does not require the special equipment or conditions provided in the smaller rooms of the first floor. Adjacent to this large laboratory is the private laboratory of the professor in charge and a balance room. Centrifugal machines, filter presses, and a hydraulic press are on the lower floor.

The *Gas and Fuel Laboratory* occupies a group of five rooms:—a general laboratory for gas analysis; a calorimeter room equipped with Mahler, Hempel, Parr, and Junkers calorimeters; a large and well-ventilated photometer room with an excellent photometer supplied with several types of standard lights and test burners; an instructor's laboratory; and a laboratory for advanced students. Unusual facilities for advanced work are offered at the experimental gas plant.

For *High Temperature Measurements* there is a specially designed LeChatelier pyrometer with its galvanometer permanently installed in the calibration room whence connections lead to various parts of the furnace room. There are also portable LeChatelier and Hoskins pyrometers and Morse and Wanner optical pyrometers. The care, repair, and calibration of these instruments is a regular part of the student's work.

The *Assay Laboratory* comprises an ore-crushing and sampling room with modern equipment, a room for the preparation of assay charges, a balance room, and a large furnace room.

For the study of *Portland Cement* there is in the furnace room a small gasoline fired rotary cement kiln which allows an accurate adjustment and determination of the burning temperature. In the cement testing room are sieves, molds, etc., and a Fairbanks-Morse testing machine, and in a constant temperature room is a micrometer for measuring changes in volume of bars of cement after setting. There are two polarising microscopes and equipment for making thin sections of clinker for microscopic examination.

The *Metallographic Laboratory* occupies three rooms adjacent to the pyrometer and the furnace rooms. Polishing lathes and the necessary facilities for treating the polished section before its microscopic examination are abundantly provided. There are four vertical illuminating microscopes, a Sauveur photomicrographic outfit and a most excellent Zeiss apparatus for the same purpose. The assay furnaces and electrically heated tube furnaces are available for heating specimens of metal, and the permanently installed pyrometer allows an accurate observation of cooling curves and recalescence points.

For *Electrometallurgy and Electrochemistry* in addition to current from the storage battery, direct current up to 400 amperes at 25 volts, up to 200 amperes at 50 volts and up to 100 amperes at 220 volts, is available, together with the auxiliary equipment for controlling and measuring it. Most of the electric furnaces have been made in the laboratory and their repair and reconstruction is a regular part of the work.

For *Clay Testing and Ceramics* there are two ball mills, two mixing machines, a brick press, and an adequate number of oil-fired kilns.

MARINE ENGINEERING LABORATORY

The *Experimental or Naval Tank* is a unique feature of the Engineering Department. The object of the tank is to enable experiments of all kinds, including resistance, propulsion, steering, etc., to be made upon models of ships and propellers. The tank occupies one side of the ground floor of the New Engineering Building, and is 300 feet long, 22 feet wide, with a depth of water of 10 feet. By means of a false bottom, which can be set in varying positions, the depth of the water can be changed so that experiments on the effect which shallow water has upon the speed of vessels, may be performed.

The tank is spanned by a traveling truck which can be driven at any desired speed. Upon this truck are mounted the necessary dynamometers to which the ship models are attached and which measure the resistance at any speed.

Adjoining the tank is the work shop where the ship models are made. The size of the models used runs from ten to twelve feet in length, and they are usually made of paraffin wax. A clay mould is first made approximately to the shape desired and a canvas core inserted. Melted paraffin is then poured into the mould and, after cooling, the rough model is transferred to a specially designed cutting machine. This consists essentially of two moving tables or platforms upon one of which is placed the rough model and upon the other the drawing of the lines of the vessel which it is desired to reproduce. The model moves under a pair of revolving cutters which are made to follow the lines upon the drawing. After cutting, the model is finally faced up by hand, carefully checked and weighed, and sufficient ballast added when it is placed in the water, to bring it to the desired draft, and displacement.

The power required to drive a full sized vessel may easily be determined from the model experiment; and systematic investigations upon various forms of vessels, are continuously performed.

The tank is also used for testing and calibrating current meters.

The *Mould Loft* is situated on the top floor of the north wing of the New Engineering Building and is used for laying off vessels on the full size. Students are also allowed the use of this room for the construction of small vessels. For this purpose steam boxes for bending frames, etc., and other necessary tools, are provided.

USE OF LABORATORIES FOR PUBLIC SERVICE

In 1913, the Regents placed the Highway Laboratory at the service of the cities, villages, counties, and highway officers of the State, for the testing of brick, stone, gravel, and other highway materials without charge other than the expense of shipment of samples. Tests are now being made of road materials and full records are being kept of this work.

Tests of sewer pipe, tile, and other classes of construction material may also be made for municipalities in the Civil Engineering Laboratories.

When practicable, tests of engines and boilers, and of machinery in general are made upon request and by special arrangement as to terms.

Tests of materials are also conducted for private parties and reported upon when desired. The data of all experiments and tests made are kept in the laboratory records.

All the laboratory work is upon a practical basis and is done as nearly as possible as it would be done in any well arranged manufacturing establishment.

OTHER LABORATORIES, LIBRARIES AND MUSEUMS

For description of other University laboratories, libraries, and collections for the study of art, archæology, ethnology, mineralogy, geology, paleontology, zoology, etc., and for general information concerning the University, see page 53.

VISITS OF INSPECTION

As often as practicable, visits of inspection are paid to the neighboring manufacturing establishments, to electric light and electric power stations, and to points of engineering interest, for the purpose of acquiring a knowledge of the methods employed in building, in the construction of bridges, machinery, and ships, and the best practice in electrical manufacturing and engineering on a large scale.

SOCIETIES

Several organizations of students are maintained, aside from the usual literary societies, for the reading of papers and holding discussions in various scientific lines.

The Engineering Society, composed of and officered by students of this Department, holds meetings, at which papers of technical interest are read, and reports made upon observations and experiments. A reading room is maintained by the society, accessible to all students of the Department. Many engineers of prominence have spoken before the society in past years.

The American Institute of Electrical Engineers has established a University of Michigan Branch to which students are eligible. Meetings of the Branch are held twice a month, when original papers, and advance copies of papers to be read at the regular

meetings of the Institute, are read and discussed. In addition to the advance copies of Institute papers, each student joining the Branch receives the Proceedings which are published monthly.

The Architectural Society holds meetings from time to time for hearing addresses by visiting or local speakers, and conducts a number of social functions.

GRADUATE COURSES

The control of courses for graduates is in the hands of the Graduate Department, under which heading their description will be found. It should be emphasized here, however, that the world is constantly setting higher standards for engineers and that it is already distinctly advantageous for all engineering students to lay a broad foundation of general courses during their four years of undergraduate work and reserve specialization for a fifth year. The group system of electives described below allows the proper freedom of election on the part of those planning to return for graduate work.

DEPARTMENT OF ENGINEERING

THE GROUP SYSTEM OF ELECTIVE STUDIES

In July, 1912, there went into effect a complete revision of all the courses in Engineering, by which it was made possible for a student in his senior year to have a much wider range of elective work than formerly. The new system provides that of the 140 hours of credit required for graduation, 125 hours only are prescribed and the remaining 15 hours may be elected from any *one* of the groups of studies outlined in some detail below. This arrangement permits a limited amount of specialization without sacrificing any of the time given to the fundamental subjects necessary to a thorough technical training. The adoption of this system has eliminated duplication of work and has placed each course in theory or design under the charge of the sub-department to which

it logically belongs, where instruction is given by specialists in each branch of work. Interdepartmental lines are broken down by this system and the entire Department of Engineering works as a unit. The various groups of studies, including the subjects given in this Department as well as the subjects open to engineering students in other Departments, include the following:

CIVIL ENGINEERING GROUPS

- (A) *Structural Engineering.*—Covering the subjects of Structural Steel and Reinforced Concrete.
Courses in theory and design of steel, concrete and masonry are given by the department of Civil Engineering.
Courses in strength and resistance of materials and testing materials are given by the department of Engineering Mechanics.
Courses in metallurgy, micro-metallurgy and chemical technology of building materials are given by the department of Chemical Engineering.
- (B) *Hydraulic Engineering.*—Covering the subjects of Hydro-Electric Power Development, Irrigation and Drainage, and Rivers and Harbors.
Courses in hydraulics, hydrography and in theory and design of the different branches of hydraulic engineering are given by the department of Civil Engineering.
Courses in hydraulic machinery, water turbines, turbine design and pumping machinery are given by the department of Mechanical Engineering.
Courses in electrical machinery, generating stations and electrical distribution are given by the department of Electrical Engineering.
- (C) *Transportation Engineering.*
Courses in railway location, construction and maintenance, railway design courses and history of transportation are given by the department of Civil Engineering.
Surveying and advanced railway surveying courses are given by the department of Surveying.
Courses in elements of accounting, railway accounting, railway operation, railway finance, railway tariffs and economics are given by the department of Political Economy.
Courses in signalling and electrical engineering are given by the department of Electrical Engineering.
- (D) *Sanitary and Municipal Engineering.*—Covering the subjects of Sanitary Engineering, Municipal Engineering and Highway Engineering.

- Courses in theory, design and laboratory are offered by the department of Civil Engineering.
- Courses in bacteriology, water analysis and hygiene are given by the Department of Medicine and Surgery.
- Courses in testing materials are given by the department of Engineering Mechanics.
- Courses in heating and ventilation are given by the department of Mechanical Engineering.
- (E) *Geodetic Engineering*.—Covering advanced work in geodesy. Courses in geodesy and least squares are offered by the department of Civil Engineering.
- Courses in practical and geodetic astronomy and least squares are offered by the department of Astronomy.
- (F) *General Engineering Science*.—This group is specially arranged to permit civil engineering students who are candidates for the bachelor's degree, to secure the fundamental training in civil engineering and to pursue advanced elective work in mathematics, physics, astronomy, mechanics or chemistry.

MECHANICAL ENGINEERING GROUPS

- (A) *Steam Power Engineering*. This group comprises all the elective courses in Mechanical Engineering relating to steam prime movers and auxiliary machinery found in steam power plants; roof trusses in the department of Civil Engineering; electric generation and distribution in the department of Electrical Engineering; fuels and refractory materials in the department of Chemical Engineering; and Political Economy.
- (B) *Internal Combustion Engineering*, comprising courses in the department of Mechanical Engineering relating to internal combustion engines and gas producers; electric generation and distribution, and ignition systems in the department of Electrical Engineering; fuels in the department of Chemical Engineering; and Political Economy.
- (C) *Machine Design*. This group naturally includes all the machine design courses together with their corresponding class room courses, given in the department of Mechanical Engineering; roof trusses in the department of Civil Engineering, and testing of materials in Engineering Mechanics.
- (D) *Hydro-Mechanical Engineering*, which consists of the courses on hydraulic machinery, in the department of Mechanical Engineering; those on hydraulic and water power development in the department of Civil Engineering; those on electric generation and distribution in the department of Electrical Engineering; and Political Economy.

- (E) *Heating and Ventilating Engineering.* This group comprises the courses relating to this general subject given in the department of Mechanical Engineering; lighting and electric wiring in the department of Electrical Engineering; hygiene in the Department of Medicine and Surgery; and courses in the department of Economics.
- (F) *Automobile Engineering.* This group consists of such courses relating to automobile work, internal combustion engines, and valve gears, as are given in the department of Mechanical Engineering; ignition systems in the department of Electrical Engineering; metallography in the department of Chemical Engineering; and of courses in the department of Economics.
- (G) *General Engineering Science.* This group aims to indicate a line of work which may be pursued by a student who desires to attain a scientific knowledge by building upon the fundamental subjects of engineering. The electives may lie within the field of mathematics, physics, chemistry, astronomy, mechanics, or mechanism. Eight of the elective hours in this group may consist of work freely selected from among any of the courses given in the University.

ELECTRICAL ENGINEERING GROUPS

- (A) *Telephone and Telegraph Engineering.* This group includes the courses given in telephony, telegraphy, railway signaling and wireless telegraphy and leaves a few hours for electives.
- (B) *Electrical Design Group.* This group includes courses given by the department of Mechanical Engineering in machine design and mechanical laboratory work with boilers and engines, an advanced course in design of electrical machinery and the choice of other courses in electrical engineering suitable to the particular field for which the student is preparing himself.
- (C) *Power Plant Group.* This group includes courses in electrical engineering in the design of electrical power plants and transmission systems and courses in mechanical engineering in machine design, water turbines, and mechanical engineering work with boilers and engines.
- (D) *Electric Railway Group.* This group includes a course in design of electrical power plants and transmission systems, an advanced course in electric railways, a mechanical laboratory course in boilers and engines, and electives in electrical engineering.
- (E) *Illumination Group.* This group includes advanced courses in lighting (electrical engineering) and in light (physics), and electives in engineering.

- (F) *General Engineering Group.* This group is intended for students who expect to continue their studies or who for some reason do not wish to specialize in their senior year in one of the other groups. In this group is included a mechanical laboratory course in boilers and engines, and the remainder of the courses are elective under the advice of the department.

CHEMICAL ENGINEERING GROUPS

- (A) *Metallurgical Group.* This group contains options from the advanced courses in metallurgy, ore dressing and chemical engineering machinery in the department of Chemical Engineering; the testing of materials in the department of Engineering Mechanics; and courses in mineralogy and geology.
- (B) *Gas Engineering Group.* This group contains options from the courses in gas manufacture and chemical engineering machinery in the department of Chemical Engineering; gas engines, power plants and the valuation of public utilities in the department of Mechanical Engineering; electrical distribution and illumination in the department of Electrical Engineering; and business organization and management in the department of Political Economy.
- (C) *Organic Industrial Group.* This group contains options from the courses in theoretical and organic chemistry in the department of Chemistry; bacteriology in the Department of Medicine; water purification and sewage disposal in the department of Civil Engineering; and courses in Political Economy.
- (D) *General Manufacturing Group.* This group contains options from the courses in chemical engineering machinery in the department of Chemical Engineering; from courses in mechanical engineering, electrical engineering and political economy; and eight hours of free electives.

MARINE ENGINEERING GROUPS

- (A) *Naval Architecture.* The courses in this department are arranged for those who wish to devote the principal part of their studies to the design and construction of ships. It also includes courses in the departments of Engineering Mechanics, Mechanical Engineering, and Electrical Engineering.
- (B) *Marine Engineering.* The courses in this department are arranged for those who wish to specialize more in the design of the machinery connected with ships. Courses in steam turbines, gas and oil engines, and hydraulic machinery are given in the department of Mechanical Engineering, and courses in electrical machinery in the department of Electrical Engineering.

DEPARTMENT OF ARCHITECTURE

EQUIPMENT

The Department of Architecture is housed in large and commodious quarters on the main floor of the New Engineering Building, immediately adjoining the library. The drafting rooms are well lighted and provided with drafting tables of special design. On the walls are hung a number of valuable original competition and measured drawings. The freehand drawing room is situated on the top floor at the north end of the New Engineering Building. It is about sixty feet square, is lighted by means of windows and a north skylight and is fully equipped for the instruction in freehand drawing, pen and ink, water color and drawing from life. There is a comprehensive collection of plaster casts of decorative and architectural form, pottery and textiles for painting from still life and several original drawings in pencil, color and pencil, pen and ink by D. A. Gregg, H. G. Ripley, and others. The architectural library is housed with the engineering library. It consists of a large amount of carefully selected reference and illustrative materials, and is made up of the standard books, about 1800 volumes, portfolios of plates, photographs and about 9000 lantern slides. The leading architectural journals are also kept on file.

NATURE OF COURSES

Architectural Design.—In the courses in Architectural Design the students work out, in the drafting room, designs for a great variety of buildings, ranging from a small house to large public buildings, problems of a practical character being interspersed with more ideal ones. The aim throughout these courses, of which there are eight offered, is to develop the imagination, creative power, ability to work out the organism of a building and skill in the clear and artistic presentation of the drawings.

The courses in Architectural Design are grouped as follows: Courses 1 and 4, Elementary Design; Courses 5, 6 and 7, Intermediate Design; Courses 8, 9 and 10, Advanced Design. Students must complete the requirements of one group before proceeding to the next. Students of average ability are able to complete this work in the usual number of years while those of unusual ability may do so in a shorter period.

In the course in *Allied Arts of Design*, designs are made for a piece of furniture, decorative glass, metal and mosaic and of other objects or features commonly used in connection with architecture.

Architectural Construction.—The work in construction continues through three years and is conducted by means of lectures, quizzes, text-books, visits to buildings, and the preparation of working drawings. The character of building materials, their practical and artistic possibilities and the methods of present building practice are studied. The drawing work of the courses in construction begins with the making of working drawings of a small building. This includes the framing plans of the floors, walls and roof, and full-size details of some essential portions. This is followed by the working drawings for a larger building of heavy construction and involves foundations, masonry walls, piers, columns, floors, roof, and details. This in turn, is followed by steel and re-inforced concrete construction, in the course of which girders, columns, trusses, and other structural work of a high, fire-proof building are designed. A course in the testing of materials is given in the senior year. Specifications are discussed in connection with the work in construction.

The courses in structural mechanics, strength and resistance of materials, testing of materials, and advanced construction or structural design are studied under specialists and given partly by the Departments of Architecture and partly by the departments of Engineering Mechanics and Civil Engineering.

Heating and Ventilation.—A special course in heating and ventilating is given for students in groups Architecture I and II by the department of Mechanical Engineering. Students in group III, Architectural Engineering, take the regular and more advanced course in that subject.

Building Illumination is a special course given for architectural students by the department of Electrical Engineering. In the course in *Building Sanitation* the principles are studied which should guide the design and installation of drainage and plumbing systems.

History of Architecture.—In these courses the development of the art of building is traced from earliest times to the present day. The causes and influences which moulded the various modes of building are analyzed and wherever possible demonstrated by means of the stereopticon. Many of the important buildings of the world are fully illustrated and critically studied, the student thus gaining an appreciation of the finest achievements of his art. Not only are the buildings studied in their larger aspects, but also in many of

their details of construction, form and detail. Historic ornament is taken up with the architecture of the various periods, as also are decorative sculpture and color. Four courses of lectures are given, extending over two years. Two lectures per week are given in each course and one quiz.

In addition to the above all architectural students take one or more courses in the history of art given by the department of Fine Arts in order to acquaint them with the development and masterpieces of painting and sculpture.

Freehand Drawing.—Considerable attention is devoted to this subject by students of Architecture. This is particularly true of Course II in which freehand drawing is carried on throughout the four years. Ten special courses are given for architectural students. The students begin drawing from simple geometrical solids involving the accurate representation of form in line and light and shade; simple decorative, natural and architectural, forms are next drawn, after which portions of the figure, the hand, foot, head, etc., are drawn from cast (Elementary Antique); then the entire figure is drawn from cast (Advanced Antique), after the satisfactory completion of which follows drawing from the living model.

Throughout this discipline, in the observation and artistic representation of line, form, proportion, light and shade, the aim is to develop in the student the power of free artistic expression. The student is advanced as rapidly as his progress warrants. The pencil, charcoal, and monochrome wash are used. A special course is provided for Architectural students in rendering in pen and ink. The instruction considers the character of such drawings necessary for reproduction. A course in painting in water color from still life is also required of students in Architecture, but may not be taken without first completing Courses 21 and 22 in Drawing, or their equivalent. Rendering in wash and color is carried on throughout the courses in design.

Clay Modeling.—Some modeling is required of students in Architecture to supplement the training in drawing and design. The instruction aims to inculcate a better appreciation of architectural form and ornament.

COURSES OF INSTRUCTION

The courses of instruction are subject to change from time to time; those announced for the year 1913-1914 and required for graduation, as stated on pages 339 and 340, together with some advanced, elective, and technical courses, are described on the following pages.

The courses given in the Department of Literature, Science, and the Arts, and described on page 134 to 267, are (with the exception of the courses in French and in German, for which special permission is required) all open as electives to engineering and architectural students who are qualified to pursue them with advantage. Students desiring to elect such courses must receive permission from the Dean of that Department and from the Committee on Classification of the Departments of Engineering and Architecture.

A student enrolled in the Department of Literature, Science, and the Arts, who desires to elect any of the work in the Departments of **Engineering and Architecture** not included in the courses offered in the former Department, must obtain written permission from the Dean of that Department, and attach it to his election slip.

COURSES OFFERED IN 1913-1914

The courses offered for the year 1913-1914 are described below. The amount of credit toward graduation assigned to each course is indicated by the expressions *one hour, two hours, etc.*

ENGLISH

The work in English is based on the assumption that the engineering or architectural student needs in general to be able to speak and to write and to enjoy books in a sensible and discriminating way. He must also prepare definitely for the particular kind of writing demanded by his profession. There have been provided, therefore, in addition to the general reading and writing courses, a number of technical courses designed to meet the special needs of the student in engineering and architecture.

FIRST SEMESTER

1. Theme-Writing and Oral Exposition. Nine sections. *Four hours.* Assistant Professor NELSON, Mr. MARCKWARDT, Dr. MORIARTY, Mr. DEFOE, Mr. BRADLEY.
2. Theme-Writing and Oral Exposition. Two sections. *Two hours.* Mr. MARCKWARDT, Mr. DEFOE.

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4. Preparation and Presentation of Technical and Scientific Papers. For juniors and seniors only. *Two hours.* Assistant Professor NELSON.
5. Commercial Correspondence. For juniors and seniors only. *Two hours.* Dr. MORIARTY.
- 6a. A Study of the Short Story. *Two hours.* Assistant Professor NELSON.
- 1a. General Reading Course. *One hour.* This course always accompanies English I.
- 1b. General Reading Course. *Two hours.* Mr. BRADLEY.
- 8a. Scientific Literature. *Two hours.* Mr. MARCKWARDT.
- A. Conversational English for Foreign Students. *Two hours.* Assistant Professor NELSON.

SECOND SEMESTER

1. Theme-Writing and Oral Exposition. Seven sections. *Four hours.* Assistant Professor NELSON, Mr. MARCKWARDT, Dr. MORIARTY, Mr. DEFOE, Mr. BRADLEY.
2. Theme-Writing and Oral Exposition. Two sections. *Two hours.* Mr. MARCKWARDT, Mr. BRADLEY.
3. Exposition Writing. For juniors and seniors only. *Two hours.* Assistant Professor NELSON.
5. Commercial Correspondence. For juniors and seniors only. Two sections. *Two hours.* Dr. MORIARTY.
6. Engineering Reports. For seniors only. *Two hours.* Assistant Professor NELSON.
8. Technical Journalism. *Two hours.* Mr. DEFOE.
- 1a. General Reading Course. *One hour.* This course always accompanies English I.
- 3a. The Modern Novel. *Two hours.* Assistant Professor NELSON.
- 7a. The Modern Drama. *Two hours.* Dr. MORIARTY.
- 9a. Scientific Reading. Two sections. *Two hours.* Mr. MARCKWARDT.
- B. Conversational English for Foreign Students. *Two hours.* Assistant Professor NELSON.

GERMAN

The aim of the instruction in German is to help the student to a reading and speaking knowledge of the language. Special attention is paid to scientific literature. Elective courses are offered for the accommodation and benefit of students who have the time and inclination to carry their language work beyond the limits of the required courses.

BOTH SEMESTERS

1. Elementary Course. Grammar and reading, with constant practice in writing and speaking German. Three sections first semester, one section second semester. *Four hours.* Professor WAIT, Dr. HAUHART and Dr. SCHWABE.

2. Elementary Course continued. Grammar and reading, with constant practice in writing and speaking German. Two sections first semester, three sections second semester. *Four hours.* Professor WAIT, Dr. HAUHART, Dr. SCHWABE, Mr. WILD and Mr. RATHKE.
3. German Scientific Literature. Nine sections the first semester and four the second. *Four hours.* Professor WAIT, Dr. HAUHART, Dr. SCHWABE, Mr. WILD, and Mr. RATHKE.
4. German Scientific and Technical Literature. Four sections the first semester and nine the second. *Four hours.* Professor WAIT, Assistant Professor LEE, Dr. HAUHART, Dr. SCHWABE, Mr. RATHKE and Mr. WILD.
In Courses 3 and 4 students of special aptitude and proficiency are given opportunity and encouraged to do extra work.
5. Advanced Course in German. Technical Literature (Elective). *Two hours.* Mr. WILD.

FRENCH

The aim of the instruction in French is to help the student to a reading and speaking knowledge of the language. Special attention is paid to scientific literature. Elective courses are offered for the accommodation and benefit of students who have the time and inclination to carry their language work beyond the limits of the required courses.

BOTH SEMESTERS

1. Elementary Course. Grammar and reading, with constant practice in writing and speaking French. Two sections each semester. *Four hours.* Assistant Professors BIRD, LEE, and KENYON.
2. Elementary Course continued. Two sections the first semester and three the second. *Four hours.* Assistant Professors LEE and ADAMS, and Mr. RATHKE.
3. French Scientific Literature. Three sections first semester, two sections second semester. *Four hours.* Assistant Professors ADAMS and KENYON and Mr. RATHKE.
4. French Scientific and Technical Literature. One section first semester, three sections second semester. *Four hours.* Assistant Professors BIRD and KENYON and Mr. RATHKE.
In Courses 3 and 4 students of special aptitude and proficiency are given opportunity and encouraged to do extra work.
5. Advanced Course in French Scientific and Technical Literature. (Elective.) *Two hours.* Assistant Professor BIRD.

SPANISH

The courses in Spanish are offered chiefly to meet the demands of students looking forward to a professional career in countries where Spanish is the prevailing medium of communication.

Opportunity for advanced work in Spanish is offered to students who desire to make themselves specially proficient in this language.

BOTH SEMESTERS

1. Elementary Course. Grammar and reading, with constant practice in writing and speaking Spanish. Two sections first semester, one section second semester. *Four hours.* Assistant Professors BIRD, ADAMS, and KENYON.
2. Elementary Course continued. Grammar and reading, with constant practice in writing and speaking Spanish. One section the first semester and two the second. *Four hours.* Assistant Professors BIRD, ADAMS, and KENYON.
3. Reading, Conversation, and Business Correspondence. *Four hours.* Assistant Professor KENYON.

MATHEMATICS**FIRST SEMESTER**

- 1E. Algebra and Analytic Geometry (I). Seventeen sections. *Four hours.* Assistant Professor LOVE, Mr. ESCOTT, Mr. STEVENS, Mr. GARRETSON, Mr. POOR, Dr. HILDEBRANT, Dr. FORT, Mr. ROUSE, and Mr. LIBBY.
- 1a. Plane Trigonometry. Seven sections. *Two hours.* Assistant Professor LOVE, Mr. STEVENS, Mr. GARRETSON, Dr. FORT, and Mr. LIBBY.
- 2E. Analytic Geometry (II). Four sections. *Four hours.* Mr. ESCOTT, Mr. STEVENS, Mr. GARRETSON, and Mr. ROUSE.
- 2c. Plane Analytic Geometry (I). One section. *Two hours.* Mr. POOR.
- 3E. Calculus (I). Twelve sections. *Five hours.* Professors ZIWET, MARKLEY, BUTTS, FIELD, and RUNNING, Assistant Professor LOVE, Mr. POOR, Dr. HILDEBRANDT, and Dr. FORT.
- 4E. Calculus (II). Four sections. *Five hours.* Professor FIELD, Assistant Professor LOVE, Mr. GARRETSON, and Dr. HILDEBRANDT.
15. Advanced Mechanics (I). *Three hours.* Professor FIELD.
17. Theory of the Potential. *Three hours.* Professor ZIWET.
33. Empirical Formulas and Graphical Methods (II). *Two hours.* Professor RUNNING.
37. Mathematical Theory of Elasticity (I). *Two hours.* Professor ZIWET.

SECOND SEMESTER

- 1E. Analytic Geometry and Algebra (I). Four sections. *Four hours.* Mr. STEVENS, Mr. ROUSE, Mr. LIBBY, and Dr. KUESTERMANN.
- 1a. Plane Trigonometry. Three sections. *Two hours.* Professor RUNNING, Mr. GARRETSON, and Dr. KUESTERMANN.
- 2a. Spherical Trigonometry. One section. *Two hours.* Mr. GARRETSON.
- 2E. Algebra and Analytic Geometry (II). Sixteen sections. *Four hours.* Assistant Professor LOVE, Mr. STEVENS, Mr. GARRETSON, Mr. POOR, Dr. HILDEBRANDT, Dr. FORT, Mr. ROUSE, Mr. LIBBY, and Dr. KUESTERMANN.
- 3E. Calculus (I). Five sections. *Five hours.* Professor FIELD, Assistant Professor LOVE, Mr. POOR, Dr. HILDEBRANDT, and Dr. FORT.
- 4E. Calculus (II). Eleven sections. *Five hours.* Professors ZIWET, MARKLEY, BUTTS, FIELD, and RUNNING, Assistant Professor LOVE, Mr. POOR, Dr. HILDEBRANDT, and Dr. FORT.
16. Advanced Mechanics (II). *Three hours.* Professor FIELD.
34. Empirical Formulas and Graphical Methods (I). *Two hours.* Professor RUNNING.
36. Vector Analysis. *Three hours.* Professor ZIWET.
38. Mathematical Theory of Elasticity (II). *Two hours.* Professor ZIWET.

PHYSICS

For a description of all courses offered in the department of Physics see page 224.

Laboratory work *twice a week*, means *two periods* of laboratory work a week, not simply two hours; credit, *two hours*. The fees for laboratory courses are based upon the *number of weekly periods* of two hours each, of laboratory work comprised in the course. Thus for a course requiring laboratory work *once a week*, the fee is \$1.00; for one requiring work *twice a week*, \$2.00; and so on.

Courses 1E and 2E are required from all students in Engineering and Architectural Engineering. The two courses are equivalent to Courses 1, 1a, 2, 2a, 3a, and 4a, offered in the Department of Literature, Science, and the Arts. Students entering the Engineering Department with advanced standing must have completed these equivalent courses before they will receive credit for 1E and 2E.

Students in groups I and II in Architecture elect Courses 1, 1a, 2, and 2a, instead of 1E and 2E.

Other courses in Physics are given in the Department of Literature, Science, and the Arts and may be elected by students of the Departments of Engineering and Architecture.

All lectures in Physics are given in the West Lecture Room of the Physical Laboratory.

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FIRST SEMESTER

- 1E. Mechanics, Sound and Heat. *Five hours.* Lectures, recitations and laboratory work. Professor HENDERSON, Assistant Professor WILLIAMS, and assistants.

In this course at least half of the semester is devoted to elementary Mechanics; the remainder of the time, to Sound and Heat, all with experimental demonstrations. All members of the class have one period a week in the laboratory.

For this course a knowledge of the first year's work in mathematics is indispensable. The course is open to those only who have satisfied the entrance requirements in physics.

1. Mechanics, Sound and Heat. *Four hours.* Lectures and recitations. Professor RANDALL and Mr. SLEATOR.

- 1a. Physical Problems. This course accompanies Course 1. No additional credit. Mr. SLEATOR.

5. Electrical Measurements. *Four hours.* Lectures, recitations, and laboratory work. Professor SMITH.

This course includes all modern methods of measuring resistance, current, and electromotive force.

Course 5 must be preceded by Courses 1, 2, and either 3a and 4a, or 3b or 4b; or by 1E and 2E. A knowledge of calculus is also required.

SECOND SEMESTER

- 2E. Magnetism, Electricity, and Light. Lectures, recitations, and laboratory work. *Five hours.* Professor HENDERSON, Assistant Professor WILLIAMS, Dr. COLBY, Mr. RICH, Mr. SLEATOR, and assistants.

Course 2E is a continuation of Course 1E.

2. Magnetism, Electricity, and Light. *Four hours.* Lectures and recitations. Professor RANDALL and Mr. SLEATOR.

- 2a. Physical Problems. This course accompanies Course 2. No additional credit. Mr. SLEATOR.

Course 2 and 2a are continuations of Courses 1 and 1a.

6. Electrical Measurements. Lectures, recitations, and laboratory work. *Three hours.* Professor SMITH.

This course is a continuation of Course 5 and includes measurements of capacity, inductance, and magnetic quantities.

CHEMISTRY

For a description of all courses offered in the department of Chemistry see page 229.

Students admitted with a deficiency in entrance chemistry must remove it by completing Courses 1 and 1a, but the credit thus obtained is entered on the admission, not the graduation requirements.

Other courses in chemistry are given in the Department of Lit-

erature, Science, and the Arts, and may be elected by students of the Departments of Engineering and Architecture, who have had the requisite preparation.

FIRST SEMESTER

1. Elementary Inorganic Chemistry. Experimental lectures and recitations. Three sections. *Two hours.* (For entrance, see above.) Professor BIGELOW.
- 1a. Laboratory Course accompanying Course 1. Six sections. *Two hours.* Dr. HARRIS.
- 2E. Principles of Inorganic Chemistry. Lectures and recitations. Seven quiz sections. *Four hours.* Assistant Professor SMEATON and Mr. ANDEREGG.
Open to those who have passed the entrance requirements in chemistry.
3. Qualitative Analysis. Recitations and laboratory work. *Seven hours.* Mr. MCALPINE.
Open to those who have completed Courses 2 and 2a, or 2E.
- 3a. Qualitative Analysis. Recitations and laboratory work. *Two sections. Four hours.* Assistant Professor WILLARD, Mr. COLE, Dr. LAIRD, and Mr. MCALPINE.
Open to those who have completed Courses 2 and 2a, or 2E.
- 3b. Qualitative Analysis. Continuation of Course 3a. *Two sections. Four hours.* Mr. CARNEY.
5. Quantitative Analysis. Beginning course. Recitations and laboratory work. *Five hours.* Professor CAMPBELL and Mr. GREATHOUSE.
Open to those who have completed Course 3 or 3b.
7. Organic Chemistry. Lectures and library studies. *Five hours.* Professor GOMBERG, and Assistant Professor CONE.
Open to those who have completed Course 3 or 3b.
15. History of Chemistry to the Period of the Phlogiston Theory and Lavoisier. *Two hours.* Assistant Professor SMEATON.
20. German Chemical Reading. *Two hours.* Assistant Professor LEE.
28. Advanced Quantitative Analysis. Laboratory work. *Five hours.* Assistant Professor WILLARD.
Open to those who have completed Course 5.
31. Independent Work in Mineral Analysis. Laboratory work. *Five hours.* Professor CAMPBELL, and Assistant Professor WILLARD.
Open to those who have completed Course 28.
34. Chemical Reading. *One hour.* Professor CAMPBELL.
Course 34 requires special permission.
42. Organic Synthesis. Laboratory work. *Three, four, or five hours.* Professor GOMBERG, and Assistant Professor CONE.
Course 42 must be preceded by Course 5 and preceded or accompanied by Course 7.

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SECOND SEMESTER

- 2E. Principles of Inorganic Chemistry. Lectures, recitations and laboratory. Seven quiz sections. *Four hours.* Assistant Professor SMEATON, and Mr. ANDEREGG.
Open to those who have passed the entrance requirements in chemistry.
2. Elementary Inorganic Chemistry. Lectures and recitations. Continuation of Course 1. Three sections. *Two hours.* Assistant Professor HALE.
- 2a. Laboratory Course accompanying Course 2. Five sections. *Two hours.* Assistant Professor HALE, and Dr. HARRIS.
Courses 2 and 2a are to be taken in place of 2E by students who have taken Courses 1 and 1a.
3. Qualitative Analysis. Recitations and laboratory work. *Seven hours.* Mr. MCALPINE.
Open to those who have completed Courses 2 and 2a, or 2E.
- 3a. Qualitative Analysis. Recitations and laboratory work. Four sections. *Four hours.* Assistant Professor WILLARD, Mr. COLE, Dr. LAIRD, and Mr. MCALPINE.
Open to those who have completed Courses 2 and 2a, or 2E.
- 3b. Qualitative Analysis. Continuation of Course 3a. Two sections. *Four hours.* Mr. CARNEY.
5. Quantitative Analysis. Beginning course. Recitations and laboratory work. *Five hours.* Professor CAMPBELL and Mr. GREATHOUSE.
Open to those who have completed Course 3 or 3b.
8. Physical Chemistry. *Four hours.* Professor BIGELOW.
10. Chemistry of Carbon Compounds. *Four hours.* Professor GOMBERG.
Open to those who have completed Course 3 or 3b, and who receive special permission.
- 15a. History of Chemistry and Development of Chemical Theory from Lavoisier to the Present. *Two hours.* Assistant Professor SMEATON.
20. German Chemical Reading. *Two hours.* Assistant Professor LEE.
28. Advanced Quantitative Analysis. Laboratory work. *Five hours.* Assistant Professor WILLARD.
Open to those who have completed Course 5.
31. Independent Work in Mineral Analysis. Laboratory work. *Five hours.* Professor CAMPBELL, and Assistant Professor WILLARD.
Open to those who have completed Course 28.
34. Chemical Reading. *One hour.* Professor CAMPBELL.
Course 34 requires special permission.

42. Organic Synthesis. Laboratory work. *Three, four, or five hours.* Professor GOMBERG and Assistant Professor CONE. Course 42 must be preceded by Course 5 and preceded or accompanied by Course 7.
47. Organic Analysis. The technical examination of various organic products, such as are used in the arts, manufactures, etc. Laboratory work with collateral reading. *Credit to be arranged.* Professor GOMBERG. Course 47 must be preceded by Courses 5 and 7.

ASTRONOMY

For a description of all courses offered in the department of Astronomy see page 222.

Courses 3 and 4 treat of the theory and practice of making and reducing astronomical observations. These courses require day and night work at the Observatory during a portion of the semester.

Course 3E is prescribed for students in Civil Engineering in the second semester, junior year.

FIRST SEMESTER

1. General Astronomy. The Solar System. Two sections. *Two hours.* Professor CURTISS, and Dr. MERRILL.
A descriptive course, including the fundamental principles of Astronomy, and a presentation of the leading facts respecting the sun, moon, planets, and comets. Occasional lantern illustrations.
3. Practical Astronomy. *Two hours.* Dr. MERRILL.
The elements of Spherical Astronomy with practical applications. Theory of the sextant and transit and their use in the determination of time, latitude, longitude and azimuth. The observational work at the Observatory in connection with this course will be varied to suit the needs of students from different departments.

SECOND SEMESTER

2. General Astronomy. Stars and Nebulae. Two sections. *Two hours.* Professor HUSSEY, and Dr. MERRILL.
A general descriptive course in stellar and nebular astronomy. Occasional lantern illustrations. May be taken in continuation with Course 1, or independently, as desired.
- 2a. Elementary Practical Astronomy. *One hour.* Professor CURTISS.
Constellation studies and telescopic examinations of the heavenly bodies. Selected problems with the celestial globe and the equatorial telescope. Observational work during the day and night at the Observatory.

3E. Spherical Astronomy. *Two hours.* DR. MERRILL.

A brief résumé of Descriptive Astronomy followed by a thorough drill in the principles of Spherical Astronomy and computation.

MINERALOGY AND PETROGRAPHY

For a description of all courses offered in the department of Mineralogy see page 238.

Courses 1, 4, 5, and 9 are designed to meet the needs of students of Civil Engineering, Forestry, and Pharmacy, teachers of the sciences in secondary schools, and others who desire a knowledge of the more common minerals and rocks, as well as the methods employed in their determination. Courses 2, 5, 9, and 12 are especially adapted to students of Geology, Chemical Engineering and others who desire a more comprehensive knowledge of the subject. Course 16 is designed especially for students of Architecture.

All courses are given in the Mineralogical Laboratory in the basement of Tappan Hall.

FIRST SEMESTER

1. Elements of Mineralogy. Lectures and laboratory work. *Two hours.* Professor KRAUS, Assistant Professor HUNT, Mr. CLARK, and assistants.

This course includes the elements of crystallography, physical and chemical properties, occurrences, uses, and determination of the more common minerals. For this course a knowledge of elementary inorganic chemistry is necessary.

2. General Mineralogy. Lectures and laboratory work. *Five hours.* Professor KRAUS, Assistant Professor HUNT, and assistants.

Students who have successfully completed Course 1 may elect this course as Course 2a and receive *three hours* credit.

Principles of crystallography, physical and chemical properties, origin, formation, decomposition, distribution, uses and determination of the more important minerals. Prerequisites, Chemistry 2 and 3.

4. Determinative Mineralogy. Laboratory work. *Two hours.* Assistant Professor HUNT.

Intended for students who have completed Course 1 and wish to become more proficient in the determination of minerals by means of their physical characters.

10. Petrography. Lectures and laboratory work. *Three, four or five hours.* Mr. CLARK.

After reviewing the optical characters and methods of investigation of crystals, the various properties of the important rock minerals are discussed in detail. The mineralogical and chemical composition, texture, genesis, forms of occurrence,

- and metamorphism of rock are then studied. The laboratory work is devoted to the systematic study of rock materials and rocks with the aid of the polarizing microscope. Prerequisites, Mineralogy 2 or 1 and 4, 6 or 6a, and 9.
12. Quantitative Blowpipe Methods. Reading and laboratory work. *Two hours.* Assistant Professor HUNT.
Practice in assaying by blowpipe methods of various kinds of ores, especially those of gold and silver. Prerequisite, Course 5.

SECOND SEMESTER

1. Elements of Mineralogy. Lectures and laboratory work. *Two hours.* Professor KRAUS, Assistant Professor HUNT, Mr. CLARK, and assistants.
This course includes the elements of crystallography, physical and chemical properties, occurrence, uses, and determination of the more common minerals. For this course a knowledge of elementary inorganic chemistry is necessary.
4. Determinative Mineralogy. Laboratory work. *Two hours.* Assistant Professor HUNT.
Intended for students who have completed Course 1 and wish to become more proficient in the determination of minerals by means of their physical character.
5. Qualitative Blowpipe Methods. *Two hours.* Assistant Professor HUNT.
This course involves the use of blowpipe reactions upon charcoal and plaster tablets, as well as other chemical methods useful in the determination of minerals. Prerequisites, Course 2, or Courses 1 and 4. Since only a limited number can be accommodated in this course, students are advised to consult the instructor as early as possible.
16. Mineralogy and Lithology. *Three hours.* Assistant Professor HUNT and Mr. CLARK.
This course is designed especially for students in architecture. Open to others only by special permission.
For this course a knowledge of elementary inorganic chemistry is necessary.

GEOLOGY

For a description of all courses offered in the department of Geology see page 242.

The courses in Geology are planned to meet the requirements of students of engineering whose profession makes some knowledge of geology essential; men who are to have in their hands the control or operation of mines (See the announcement concerning mine administration under Courses in Commerce); and consulting geologists and geological engineers.

Research is especially encouraged along the lines of structural geology, paleontology, tectonic geology, glacial geology, and geo-

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physics. One or more advanced students may generally make arrangements for summer field work in connection with collecting trips in paleontology.

FIRST SEMESTER

- 1E. Introduction to Geology, for Engineering and Forestry Students. A course adapted to the needs of students in these departments and not open to others except by special permission. *Three hours.* Professors HOBBS and CASE, Dr. COOK, and assistant.
3. Physiography. Lectures, generally illustrated by lantern. Frequent excursions. At least one long excursion during the course. *Three hours.* Assistant Professor SCOTT and assistant.
5. The Origin, Structure and Growth of Mountains. A course for advanced students and treating the conditions which give rise to mountains, the seismic and volcanic phenomena connected with their growth, and with the mechanics of folding and the types of flexures in mountain ranges. Given in 1915-1916 and alternate years. *Four hours.* Professor HOBBS.
- 11b. Stratigraphical Geology of North America. An account of the development of the continent as recorded in the deposits, the faunal changes and the diastrophic movements. The subject will be treated in a broad way and the student introduced to the sources of information. *Three hours.* Professor CASE. Prerequisite, Course 11a. Given in 1914-1915 and alternate years.
- [16a. Economic Geology (non-metals). A general course treating of the nature, occurrence, and distribution of the non-metallic mineral resources such as coal, oil and gas, salt, gypsum, building stones, phosphate rock, etc. Geology 1a or 1E and Mineralogy 1 are prerequisite, while Geology 1b is strongly recommended. *Three hours.* Given in 1914-1915 and alternate years. Dr. COOK.]
- [17. Metamorphism. A study of geology from the physico-chemical standpoint. This course is essential to an understanding of the origin and character of ore deposits. Prerequisites are Geology 1a or 1E and Mineralogy 2 or their equivalents, and a course in physical chemistry is strongly recommended. *Three hours.* Given in 1914-1915 and alternate years. Dr. COOK.]
19. Ore Deposits. A detailed study of the character, origin, and exploitation of the iron, lead, zinc, copper, silver, and gold ores. This course should be preceded by Geology 1a or 1E and 1b and 17. Geology 16b is also recommended. *Three hours.* Given in 1915-1916 and alternate years. Dr. COOK.

22. Research Work. The department is prepared to direct research work along several distinct lines, viz., in Dynamical and Structural Geology, Stratigraphical Geology, in Glacial Geology, in Physiographical Geology, in Paleontology and in problems involved in the deposition of ores. Professors HOBBS and CASE, Assistant Professor SCOTT, Dr. COOK, and Mr. LEVERETT.

SECOND SEMESTER

- 1E. Introduction to Geology for Engineering and Forestry Students. A course adapted to the needs of students in these departments and not open to others except with special permission. *Three hours.* Lectures. Professors HOBBS and CASE, Assistant Professor SCOTT and assistant.
- 11a. Interpretation of Geologic Maps. A course designed to give the student practice in the interpretation of geologic maps together with a detailed knowledge of the structural geology of typical regions in the United States. *Three hours.* (Given in 1915-1916 and alternate years). This course to be followed by 11b. Dr. COOK.
12. Elementary Meteorology. This course is designed to follow the course in physiography and is an elementary treatment of the dynamics of the atmosphere. In it will be discussed the properties and movements of the atmosphere, weather and its variations, together with some account of weather prediction. *Two hours.* Assistant Professor SCOTT.
15. Soil Geology. A repetition of this course as given in the first semester. *Three hours.* Dr. COOK.
- [16b. Economic Geology (metals). In this course the metallic mineral resources are treated in the same manner as are the non-metallic resources during the first semester. Although this course may be elected independently of Geology 16a, both are essential to a general survey of the subject. Prerequisites the same as for Geology 16a. *Three hours.* Given in 1914-1915 and alternate years. Dr. COOK.]
22. Research Work.

DRAWING

FIRST SEMESTER

1. Geometrical Drawing. *Four hours.* (Elective.) Mr. ABBOTT.
2. Free-Hand Drawing, Pencil, Pen and Ink. Sketching. Two sections. *Two hours.* (Elective.) Miss HUNT.
4. Descriptive Geometry. Recitations and Drawing. Ten sections. *Four hours.* Professor GOULDING, Mr. FINCH, Mr. MILLER, Mr. ABBOTT, Mr. KRISTAL, Mr. FOX, Mr. HOEXTER, and Mr. McGRATH.
- 4a. Descriptive Geometry and Shades and Shadows. Recitations and drawing. *Four hours.* Mr. MILLER and Mr. BENNETT.

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- 5a. Advanced Projections and Stereotomy. *Two hours.* Mr. BENNETT.
Course 5a must be preceded by Course 4a.
- 8. Continuation of Course 7. *Two hours.* (Elective.) Miss HUNT.
Course 8 must be preceded by Courses 2, 3 and 7.
- 9. Water-Color Drawing. Historic Ornament and Design. *Three hours.* (Elective.) Miss HUNT.
- 10. Free-Hand Lettering. Three sections. *Two hours.* (Elective).
Mr. MILLER and Mr. HOEXTER.
- 21. Free-Hand Drawing. (Charcoal). Mr. BENNETT.
- 22. Free-Hand Drawing. (Pencil). *Two hours.* Mr. BENNETT.
- 23. Free-Hand Drawing. (Pencil and Wash). *Two hours.* Mr. EVERETT.
- 24. Free-Hand Drawing. (Water Color from Still Life). *Two hours.* Mr. EVERETT.
- 25. Free-Hand Drawing. (Water Color). *Two hours.* Mr. EVERETT.
- 26. Free-Hand Drawing. (Advanced Water Color). *Two hours.* Mr. EVERETT.
- 27. Free-Hand Drawing. (Pen and Ink). *Two hours.* Mr. EVERETT.
- 30. Free-Hand Drawing. (Drawing from Life). *Two hours.* Mr. EVERETT.
- 34. Clay Modeling. (Elective). *Two hours.* Mr. EVERETT.

SECOND SEMESTER

- 2. Free-Hand Drawing. Pencil, Pen and Ink. Sketching. *Two hours.* (Elective). Miss HUNT.
- 3. Free-Hand Drawing. (Advanced). *Three hours.* (Elective). Miss HUNT.
- 4. Descriptive Geometry. Recitations and Drawing. Ten sections. *Four hours.* Professor GOULDING, Mr. FINCH, Mr. MILLER, Mr. ABBOTT, Mr. KRISTAL, Mr. FOX, and Mr. HOEXTER.
- 4a. Descriptive Geometry and Shades and Shadows. Recitations and drawing. *Four hours.* Mr. BENNETT.
- 5a. Advanced Projections and Stereotomy. Two sections. *Two hours.* Mr. MILLER and Mr. BENNETT.
- 7. Water-Color Drawing. *Two hours.* (Elective). Miss HUNT.
- 9a. Water-Color Drawing. Historic Ornament and Design (continued). *Three hours.* (Elective). Miss HUNT.
- 10. Free-Hand Lettering. *Two hours.* (Elective). Mr. HOEXTER.
- 22. Free-Hand Drawing. *Two hours.* Mr. BENNETT.
- 23. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
- 24. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
- 25. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
- 26. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
- 28. Free-Hand Drawing. *Two hours.* Mr. EVERETT.
- 34. Clay Modeling. (Elective). *Two hours.* Mr. EVERETT.

SHOP PRACTICE

All courses in shop practice are under the direction of Professor W. L. MIGGETT, Superintendent of Shops. Instruction is given in the various branches by special shop assistants.

The shop courses consist of actual practice in the shops, together with class-room recitations for which outside preparation is made from text-books and oral instruction. Courses 1 to 3 may be continued by advanced students as Courses 1a to 3a. Special arrangements are made for students who desire to take more advanced shop courses with a view of preparing themselves for teaching these subjects.

FIRST SEMESTER

1. Wood Shop and Forge Shop. Five sections. *Four hours.*
2. Pattern-making and Foundry. Two sections. *Four hours.*
3. Machine Shop. Two sections. *Four hours.*

SECOND SEMESTER

1. Wood Shop and Forge Shop. Five sections. *Four hours.*
2. Pattern-making and Foundry. Two sections. *Four hours.*
3. Machine Shop. Four sections. *Four hours.*
5. Instrument Making. *Two hours.*

SURVEYING

Courses 1, 2 and 3 are designed primarily for students of Civil Engineering. Students of Landscape Design are now required to take these courses and they are frequently elected by others who desire a thorough training in the theory and practice of surveying. All courses are given on the campus at Ann Arbor, except Course 3, which embraces the field work at Camp Davis. Course 4 is offered for the convenience of students who desire a brief course in the use of instruments. All students of engineering, except those of the Civil Engineering Division, are required to take this course. It is offered both semesters and during the summer session. Courses 12 and 13 are designed for students of Forestry. The work prescribed therein runs parallel to Courses 1 and 2 in so far as possible. When students have completed Courses 12 and 13 they are qualified to elect Course 3.

Course 3 is given during the regular summer session, beginning soon after the first of July and ending a few days after the 20th of August. The camp is conducted on a practical basis and the methods employed are such as are generally applied in the field. The student is able to secure different work for practically every day of the session, however, so that the training obtained is more varied than an engineer would receive in a period covering many years of actual service in the field. The exercises embrace railroad surveys, triangulation surveys, sounding work, earthwork, azimuth observa-

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tions and computations, adjustments of instruments, stadia surveys, canal surveys, the measurement of base lines, office work, etc.

Students cannot successfully carry the elementary courses in surveying until they have completed a thorough course in plane trigonometry. The student has less difficulty after he has completed courses in analytic geometry and higher algebra.

BOTH SEMESTERS

1. Elementary surveying. Lectures. Text-book and field practice. *Three hours.* Four sections. Assistant Professors MERRICK and ATWELL, Mr. CAREY, and Mr. BAILEY.
Course 1 is given only during the first semester, field work being prosecuted until about the first of December.
2. Continuation of Course 1. *Four hours.* Professor Johnston, Assistant Professors MERRICK and ATWELL, Mr. CAREY, and Mr. BAILEY.
Course 2 is given during the second semester only.
3. Summer work at Camp Davis, described above.
4. Use of instruments. Four sections. *Two hours.* Assistant Professors MERRICK and ATWELL, Mr. CAREY, and Mr. BAILEY.
Course 4 is offered both semesters and during the summer session.
6. Geodesy. Lectures. Reading. *Three hours.* Professor JOHNSTON. Both semesters.
7. Municipal Surveying. *Two hours.* Mr. COX. Both semesters.
9. Railway Surveying. *One hour.* Mr. BAILEY. Second semester only.
10. Engineering photography. *Two hours.* Professor JOHNSTON and Mr. BRODIE. Both semesters.
12. Surveying and drawing, elementary, for students of Forestry. *Four hours.* Assistant Professor RASCHBACHER and Mr. BRODIE. First semester only.
13. Continuation of Course 12, for students of Forestry. *Four hours.* Assistant Professor RASCHBACHER and Mr. BRODIE. Second semester only.

ENGINEERING MECHANICS

FIRST SEMESTER

1. Kinematics. Kinetics. Statics. Elements of Graphical Statics. Five sections. *Four hours.* Professor DECKER, Mr. FRENCH, Mr. LADD, and Mr. BRINGHURST.
Course 1 must be preceded by Course 3E in Mathematics and Course 1E in Physics.

2. Strength and Resistance of Materials. Fundamentals of Structural Design. Theory of strength and stiffness of beams, girders, columns, shafts, etc. Seven sections. *Three hours.* Professor DECKER, Assistant Professors FISHLEIGH and MENEFEE, Mr. FRENCH, Mr. AIREY, and Mr. ABBOTT.
Course 2 must be preceded by Course 1 in Engineering Mechanics.
3. Dynamics. Work and Energy. The use of velocity, acceleration and other diagrams in the studying of dynamic problems relating to machines. Six sections. *Three hours.* Professor RUNNING, Assistant Professors FISHLEIGH and MENEFEE, and Mr. AIREY.
Course 3 must be preceded by Course 1 in Engineering Mechanics.
4. Hydromechanics. Pressure of fluids. Flotation. Flow of water through pipes and orifices, over weirs and in open channels. Three sections. *Two hours.* Mr. FRENCH and Mr. LADD.
Course 4 must be preceded by Course 1 in Engineering Mechanics.
5. Testing Materials. A study of methods and results of laboratory investigations of the physical properties of Engineering materials. Two sections. *Two hours.* Assistant Professor MENEFEE and laboratory assistant.
Course 5 must be preceded by Courses 1 and 2 in Engineering Mechanics.
6. Strength of Materials. Testing. The elementary theory of the strength of ties, struts, beams and shafts. Laboratory practice in commercial testing and investigation methods. One section. *Three hours.* Assistant Professor MENEFEE and laboratory assistant.
Course 6 must be preceded by Course 1 or 11 in Engineering Mechanics.
It is an abridgement of the work covered in Courses 2 and 5 and may not be elected by any one who has passed, or intends to elect, either of these courses.
12. Advanced Statics. *Two hours.* Mr. McCONKEY.

SECOND SEMESTER

1. Kinematics. Kinetics. Statics. Elements of Graphical Statics. Ten sections. *Four hours.* Assistant Professor FISHLEIGH, Mr. FRENCH, Mr. AIREY, Mr. LADD, Mr. FINCH, Mr. FOX, Mr. ABBOTT, Mr. STEVENS, and Mr. BRINGHURST.
Course 1 must be preceded by Course 3E in Mathematics and Course 1E in Physics.
2. Strength and Resistance of Materials, Fundamentals of Structural Design, Theory of the strength and stiffness of beams,

girders, columns, shafts, etc. Six sections. *Three hours.* Professor DECKER, Mr. FRENCH, Mr. AIREY, Mr. LADD, and Mr. BRINGHURST.

Course 2 must be preceded by Course 1 in Engineering Mechanics.

3. Dynamics. Work. Energy. Power. Moments of Inertia. Kinetics of machinery; brakes, governors, etc. Five sections. *Three hours.* Assistant Professors FISHLEIGH and MENEFFEE, and Mr. AIREY.

Course 3 must be preceded by Course 1 in Engineering Mechanics.

4. Hydromechanics. Pressure of fluids; flotation; flow of water through pipes and orifices, over weirs and in open channels. Five sections. *Two hours.* Professor KING, Assistant Professor MENEFFEE, Mr. FRENCH, and Mr. LADD.

Course 4 must be preceded by Course 1 in Engineering Mechanics.

5. Testing Materials. A study of methods and results of laboratory investigations of the physical properties of engineering materials. Two sections. *Two hours.* Assistant Professor MENEFFEE and laboratory assistant.

6. Strength of Materials. Testing. The elementary theory of the strength of ties, struts, beams and shafts. Laboratory practice in commercial testing and investigation methods. One section. *Three hours.* Assistant Professor MENEFFEE and laboratory assistant.

Course 6 must be preceded by Course 1 or 11 in Engineering Mechanics. It is an abridgement of the work covered in Courses 2 and 5, and may not be elected by any one who has passed, or intends to elect either of these courses.

11. Elementary Statics. Stresses in simple trusses by graphic and algebraic methods. One section. *Four hours.* Mr. MC-CONKEY.

CIVIL ENGINEERING

The work offered in this department includes Structural, Hydraulic, Transportation, Municipal, Sanitary, Highway and Geodetic Engineering.

The Announcement of the Department of Engineering should be consulted for information as to the sequence of courses.

FIRST SEMESTER.

1. Roofs and Bridges. *Three hours.* Professor GRAM and Mr. BRINGHURST.
2. Reinforced Concrete and Masonry. *Three hours.* Professor GRAM.

3. Structural Design—Roofs and Bridges. *Two hours.* Mr. BRINGHURST.
4. Framed Structures. *Two hours.* Professor GRAM.
10. Hydrography. *Three hours.* Professor KING.
11. Hydraulics. *Two hours.* Professor KING.
20. Railroad Location. *Two hours.* Professor RIGGS.
- 20a. Railroad Location (Drawing). *One hour.* Professor RIGGS and Mr. LADD.
21. Railroad Construction. *Two hours.* Professor RIGGS.
30. Water Supply. *Three hours.* Professor HOAD.
32. Sewerage. *Two hours.* Professors HOAD and DECKER.
34. Sanitary Science. *One hour.* Professor HOAD.
37. Roads and Pavements. *Two hours.* Mr. COX.
39. Highway Laboratory. *Two hours.* Mr. COX.
40. Spherical Trigonometry and Least Squares. *Three hours.* Professor Johnston.
41. Geodesy. *Three hours.* Professor Johnston.
43. Spherical Mapping. *Two hours.* Professor Johnston.

SECOND SEMESTER

1. Roofs and Bridges. *Three hours.* Professor GRAM and Mr. BRINGHURST.
3. Structural Design. Roofs and Bridges. *Two hours.* Mr. BRINGHURST.
4. Framed Structures. *Two hours.* Professor GRAM.
5. Advanced Structural Design. *Three hours.* Mr. BRINGHURST.
6. Advanced Masonry and Reinforced Concrete. *Two hours.* Professor GRAM.
12. Development of Water Power. *Three hours.* Professor KING.
14. Irrigation and Drainage. *Two hours.* Professors KING and JOHNSTON.
15. Irrigation and Drainage. Advanced Course. *Two hours.* Professors KING and JOHNSTON.
16. Design of Hydraulic Structures. *Three hours.* Professor KING and Mr. WISLER.
17. Advanced Hydraulic Design. *Two hours.* Professor KING.
18. Rivers and Harbors. *One hour.* Professor KING.
22. Railway Maintenance. *Two hours.* Professor RIGGS and Mr. SEILEW.
23. Railway Office Practice (Design). *Three hours.* Professor RIGGS and Mr. BAILEY.
24. Advanced Railway Design. *Three hours.* Professor RIGGS and Mr. BAILEY.
25. History of the Development of Transportation Systems. *Two hours.* Professor RIGGS.
31. Water Purification. *Two hours.* Professor HOAD.
32. Sewerage. *Two hours.* Professors HOAD and DECKER.
33. Sewage Disposal. *Two hours.* Professor HOAD.

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35. Sanitary Engineering Design. *Three hours.* Professor HOAD.
36. Municipal Engineering—a course in Municipal problems—street cleaning, garbage disposal, maintenance of municipal works, franchises, ordinances and specifications and contracts. *Two hours.* Professors RIGGS and HOAD.
37. Roads and Pavements. *Two hours.* Mr COX.
38. Advanced Highway Engineering. *Two hours.* Mr. COX.
39. Highway Laboratory. *Two hours.* Mr. COX.
42. Geodetic Systems. *Two hours.* Professor JOHNSTON.
43. Spherical Mapping. *Two hours.* Professor JOHNSTON.

MECHANICAL ENGINEERING

For sequence of courses, see Engineering Announcement.

BOTH SEMESTERS

1. Principles of Mechanism. Five sections. *Four hours.* Both semesters. Professors GOULDING and MIGGETT, Mr. FINCH, Mr. KRISTAL, and Mr. FOX.
2. Machine Drawing. Five sections. *Two hours.* Both semesters. Assistant Professor GREINER, and Mr. WILSON.
3. Steam Engines and Other Heat Engines. Seven sections. *Four hours.* Both semesters. Professors ALLEN and ANDERSON, Assistant Professor VERNER, Mr. LLOYD, and Mr. WILSON.
4. Hydraulic Machinery. *Three hours.* Both semesters. Professor ZOWSKI.
5. Thermodynamics. *Three hours.* Both semesters. Professor ANDERSON and Assistant Professors FESSENDEN and VERNER.
6. Theory of Machine Design. Two sections. *Four hours.* Both semesters. Assistant Professor GREINER.
7. Mechanical Laboratory. Calibration of Instruments and Measurement of Power. Six sections. *Two hours.* Both semesters. Assistant Professor EMSWILER and Mr. LLOYD.
8. Mechanical Laboratory. Testing of Heat Engines and Air Machinery. Three sections. *Three hours.* Both semesters. Assistant Professor EMSWILER and Mr. LLOYD.
9. Power Plants and Power Transmission. *Two hours.* Both semesters. Professor ANDERSON and Assistant Professor FESSENDEN.
- 9a. Design of Power Plants. *Three hours.* Both semesters. Professor ANDERSON.
10. Public Utilities. *One hour.* Second semester. Professor COOLEY.
11. Steam Boilers. *Three hours.* Both semesters. Assistant Professor FESSENDEN.
- 11a. Design of Steam Boilers. *Three hours.* Both semesters. Assistant Professor FESSENDEN.
12. Steam Reciprocating Engines. *Three hours.* Second semester. Assistant Professor FESSENDEN.

- 12a. Design of Steam Reciprocating Engine. *Three hours.* Second semester. Assistant Professor FESSENDEN.
13. Steam Turbines. *Three hours.* Both semesters. Assistant Professor EMSWILER.
- 13a. Design of Steam Turbines. *Three hours.* Second semester. Assistant Professor EMSWILER.
14. Valve Gears. *Two hours.* Both semesters. Assistant Professor FESSENDEN.
15. Internal Combustion Engines and Gas Producers. *Three hours.* Both semesters. Assistant Professor GREINER.
- 15a. Design of Internal Combustion Engines. *Three hours.* Both semesters. Assistant Professor GREINER.
16. Water Turbines. *Three hours.* Second semester. Professor ZOWSKI.
- 16a. Design of Water Turbines. *Three hours.* Both semesters. Professor ZOWSKI.
17. Pumps and Compressors. *Three hours.* First semester. Professor ZOWSKI.
- 17a. Design of Pumps and Compressors. *Three hours.* Second semester. Professor ZOWSKI.
18. Heating and Ventilation. *Three hours.* Both semesters. Professor ALLEN.
- 18a. Design of Heating and Ventilation Systems. *Three hours.* Second semester. Professor ALLEN.
19. Refrigeration. *Two hours.* Second semester only. Professor ALLEN.
20. Mechanical Handling of Materials. Both semesters. *Two hours.* Assistant Professor VERNER.
- 20a. Design of Hoisting and Conveying Machinery. *Three hours.* Both semesters. Assistant Professor VERNER.
- 21a. Design of Machine Tools. *Three hours.* Second semester only. Professor MIGGETT.
22. Mechanical Laboratory. Advanced Course. *Two or three hours.* Both semesters. Assistant Professor EMSWILER and Mr. LLOYD.
23. Hydraulic Laboratory. Advanced Course. *Two or three hours.* Both semesters. Professor ZOWSKI.
24. Prime Movers. *Three hours.* First semester. Assistant Professor FESSENDEN.
25. Elementary Heating and Ventilation. *Two hours.* First semester. Professor ALLEN.
26. Mechanical Technology. *One hour.* Second semester. Assistant Professor FESSENDEN.
27. Estimating. *One hour.* Second semester. Professors COOLEY, RIGGS, and ANDERSON.
28. Automatic Machinery. *Two hours.* Both semesters. Mr. HOEXTER.

- 28a. Design of Automatic Machinery. *Two hours.* Both semesters. Mr. HOEXTER.
29. Gasoline Automobiles. *Three hours.* Both semesters. Assistant Professor FISHLEIGH.
- 30a. Automobile Motor Theory and Design. *Three hours.* Second semester. Assistant Professor FISHLEIGH.
32. Automobile Testing. *Two hours.* Both semesters. Assistant Professor FISHLEIGH.
33. Critical Speeds and Gyroscopical Phenomena. *Two hours.* Both semesters. Mr. AIREY.

ELECTRICAL ENGINEERING

FIRST SEMESTER.

1. Dynamo-Electric Machinery. Lectures, recitations, and laboratory work. *Four hours.* Professors BAILEY and HIGBIE, Assistant Professor LOVELL, Mr. WILSON, and Mr. WINES.
Course 1 must be preceded by Courses 1E and 2E in Physics.
It is intended for students not candidates for the degree in Electrical Engineering.
2. Direct Current Machinery. Lectures, recitations and laboratory work. *Four hours.* Professor Patterson and Mr. WINES.
Course 2 must be preceded by Course 5 in Physics.
3. Alternating Current Generators and Transformers. Lectures, recitations and laboratory work. *Four hours.* Professors PATTERSON, BAILEY, and HIGBIE, Assistant Professor LOVELL, and Mr. WILSON.
Course 3 must be preceded by Course 2.
4. Alternating Current Motors. Lectures, recitations and laboratory work. *Three hours.* Professor BAILEY and Assistant Professor LOVELL.
Course 4 must be preceded by Course 3.
5. Design of Electrical Machinery and Appliances. Lectures, recitations and drawing. *Four hours.* Professor BAILEY and Mr. WILSON.
Course 5 must be preceded by Course 1 or 2.
7. Photometry and Electric Lamps. Lectures, recitations and laboratory work. *Two hours.* Professor HIGBIE and Mr. WINES.
Course 7 must be preceded by Course 1 or 2.
- 7a. Building Illumination. Lectures and recitations. *One hour.* Professor HIGBIE.
Course 7a is designed for students in Architecture. It must be preceded by Course 1 or 2.
9. Storage Battery Installations. Lectures and laboratory work. *One hour.* Professor HIGBIE.
Course 9 must be preceded by Course 1 or 2.

11. Electric Generating Stations and Sub-Stations. Lectures. *Two hours.* Assistant Professor LOVELL.
Course 11 must be preceded by Course 1 or 2.
13. Telephones. Lectures, recitations and laboratory work. *Four hours.* Mr. SHEPPARD and Dr. TRAMM.
Course 13 must be preceded by Course 1 or 2.
17. Applied Electrical Engineering. *Two hours.* Professor BAILEY.
18. Research Work. *Two hours.* Members of the Department Faculty.
25. Electrical Engineering Seminary. *Two hours.* Professor BAILEY.
27. Application of Advanced Mathematics to Problems in Electrical Engineering. *Two hours.* Professor PATTERSON.

SECOND SEMESTER

1. Dynamo-Electric Machinery. Lectures, recitations and laboratory work. Five sections. *Four hours.* Professor BAILEY, Assistant Professor LOVELL, and Mr. WILSON.
Course 1 must be preceded by Courses 1E and 2E in Physics.
It is intended for students not candidates for the degree in Electrical Engineering.
2. Direct Current Machinery. Lectures, recitations and laboratory work. Two sections. *Four hours.* Professor PATTERSON and Mr. WINES.
Course 2 must be preceded by Courses 1E, 2E, 3b, 4 and 5 in Physics.
It is required for candidates in Electrical Engineering.
3. Alternating Current Generators and Transformers. Lectures, recitations and laboratory work. *Four hours.* Professors PATTERSON, BAILEY, and HIGBIE, and Mr. WILSON.
4. Alternating Current Motors. Lectures, recitations and laboratory work. Three sections. *Two hours.* Professor BAILEY, Assistant Professor LOVELL, and Mr. WINES.
Courses 4 must be preceded by Course 3.
6. Design of Electrical Machinery and Appliances. Lectures and Drawing. *Two hours.* Professor BAILEY and Mr. WILSON.
Course 6 must be preceded by Course 5, of which Course 6 is a continuation.
- 6a. Design of Electrical Machinery and Appliances. Lectures, recitations and drawing. *Four hours.* Professor BAILEY.
Course 6a includes the same class work as Course 6 but has more drawing.
7. Photometry and Electric Lamps. Lectures, recitations and laboratory work. *Two hours.* Professor HIGBIE and Mr. WINES.
Course 7 must be preceded by Course 1 or 2.
8. Electric Railways. Lectures and recitations. *Two hours.* Assistant Professor LOVELL.
Course 8 must be preceded by Course 1 or 2.

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10. Alternating Current Phenomena. Lectures and reading. *Two hours.* Professor PATTERSON.
12. Distribution of Electricity. Lectures. *Two hours.* Assistant Professor LOVELL.
Course 8 must be preceded by Course 1 or 2.
13. Telephones. Lectures, recitations and laboratory work. *Two hours.* Mr. SHEPPARD and Dr. TRAMM.
Course 13 must be preceded or accompanied by Course 1 or 2.
15. Advanced Illumination. Lectures, recitation, and laboratory work. *Two hours.* Professor HIGBIE.
Course 15 must be preceded by Course 7.
16. Advanced Telephone Apparatus. Lectures, recitations and laboratory work. *Three hours.* Mr. SHEPPARD and Dr. TRAMM.
17. Applied Electrical Engineering. Lectures and recitations. *Two hours.* Professor BAILEY.
18. Research Work in Electrical Engineering. *Two hours.* Under the direction of the Faculty of the Department.
19. Design of Electrical Power Plants and Transmission Systems. *Two hours.* Assistant Professor LOVELL.
20. Electric Telegraphs. *Two hours.* Mr. ROGERS.
21. Telephone Plant Design. *Two hours.* Mr. SHEPPARD.
22. Wireless Telegraphy and Telephony. *Two hours.* Mr. SHEPPARD.
27. Application of Advanced Mathematics to Problems in Electrical Engineering. *Two hours.* Professor PATTERSON.
30. Electrical Ignition and Application of Electricity to Automobiles. Lectures and recitations. *One hour.* Professor BAILEY.
Course 30 must be preceded by Course 1 or 3.
31. Wiring Systems. Lectures and recitations. *One hour.* Assistant Professor LOVELL.
Course 31 must be preceded by Course 1 or 3.

CHEMICAL ENGINEERING

FIRST SEMESTER

1. Iron and Steel. Lectures and recitations. *Two hours.* Assistant Professor WHITE.
Open to those who have completed Course 3a in Chemistry and Course 1E in Physics.
2. Fuels. Water, Refractory Materials, Gas Producers and High Temperatures. Lectures, recitations and assigned readings. *Two hours.* Assistant Professor WARE.
Open to those who have completed Course 3a in Chemistry and Course 1E in Physics.
3. Building Materials:—Clay, Brick, Portland Cement, Glass and Protective Coatings. Lectures, recitations and assigned readings. *Two hours.* Assistant Professor WARE.
Open to those who have completed Course 3a in Chemistry and Course 1E in Physics.

4. Salts, Acids, Alkalies and Electrochemical Processes. Lectures, recitations and assigned readings. *Two hours.* Professor WHITE.
Open to those who have completed Course 3a in Chemistry and Course 2E in Physics.
8. Metallography. Lectures and laboratory work. *Two hours.* Assistant Professor WHITE.
Open to those who have completed Course 1, together with Course 5 in Chemistry or Course 1 in Engineering Mechanics.
9. Technical Examination of Gas and Fuel. *Two hours.* Mr. BADGER and Mr. RUE.
Open to those who have completed Course 2, together with Course 5 in Chemistry or Course 7 in Mechanical Engineering.
10. Methods of Assaying Gold and Silver Ores. *Two hours.* Mr. BADGER.
Open to those who have completed Chemistry 28. A knowledge of mineralogy is desired.
11. Current Technical Journals. *Two hours.* Mr. RUE.
Open to those who have completed four hours work in Chemical Engineering and German 4 or French 4. German 9 is recommended.
12. Special Problems. Largely laboratory work. *Three to eight hours.* Professors CAMPBELL and WHITE, Assistant Professors WARE and WHITE, Mr. BADGER, and Mr. RUE.
Open to those who have completed Courses 1, 2, 3 and 4 and Chemistry 28, with Course 5 and Chemistry 7 and 7a in addition if the subject involves organic chemistry. A reading knowledge of French or German (preferably German) is also required.
This course may be continued as Course 12a.
13. Evaporation, Distillation, Filtration, and Transportation of Liquids on the Manufacturing Scale. *Two hours.* Mr. BADGER.
Course 13 must be preceded by Course 4.
15. Seminary. Reading and reports on assigned topics. *Two hours.* Professor WHITE.
Open only to graduates and seniors. A reading knowledge of French or German is required.
17. Ore Dressing. *Two hours.* Lectures and class work on the crushing, sizing, and concentration of ores and coals. Assistant Professor WHITE.
Open to those who have completed Courses 1 and 2, and either Course 5 in Chemistry or Course 1 in Mineralogy and Course 1E in Geology.
18. Metals and Alloys. Class and laboratory work. *Three to five hours.* Assistant Professor WHITE.
Open to those who have completed Course 1, and Course 5 in Chemistry or Course 2 in Engineering Mechanics.

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21. Special Laboratory Work. *Five to eight hours.* This is research work along special lines. These courses are open only to graduates and seniors who receive special permission.
- a. The Constitution of Steel. Professor CAMPBELL.
 - b. Hydraulic Cements. Professors CAMPBELL and WHITE.
 - c. Gas Manufacture and Purification. Professor WHITE.
It should be preceded or accompanied by Course 16.
 - d. Paints and Varnishes. Assistant Professor WARE.

SECOND SEMESTER

- 1. Iron and Steel. Lectures and recitations. *Two hours.* Assistant Professor WHITE.
Open to those who have completed Course 3a in Chemistry and Course 1E in Physics.
- 2. Fuels, Water, Refractory Materials, Gas Producers and High Temperatures. Lectures, recitations and assigned readings. *Two hours.* Assistant Professor WARE.
Open to those who have completed Course 3a in Chemistry and Course 1E in Physics.
- 3. Building Materials:—Clay, Brick, Portland Cement, Glass and Protective Coatings. Lectures, recitations and assigned readings. *Two hours.* Assistant Professor WARE.
Open to those who have completed Course 3a in Chemistry and Course 1E in Physics.
- 5. Chemical Technology of Carbon Compounds. Lectures and recitations. *Four hours.* Professor WHITE.
Open to those who have completed Course 2 or 4, and Course 7 in Chemistry.
- 7. Non-ferrous Metals. Lectures and recitations. *Two hours.* Mr. BADGER.
Open to those who have completed Courses 1 and 2.
- 8. Metallography. Lectures and laboratory work. *Two hours.* Assistant Professor WHITE.
Open to those who have completed Course 1, together with Course 5 in Chemistry or Course 1 in Engineering Mechanics.
- 9. Technical Examination of Gas and Fuel. *Two hours.* Mr. BADGER and Mr. RUE.
Open to those who have completed Course 2, together with Course 5 in Chemistry or Course 7 in Mechanical Engineering.
- 10. Methods of Assaying Gold and Silver Ores. *Two hours.* Mr. BADGER.
Open to those who have completed Chemistry 28. A knowledge of mineralogy is desired.
- 11. Current Technical Journals. *Two hours.* Mr. RUE.
Open to those who have completed four hours work in Chemical Engineering and German 4 or French 4. German 9 is recommended.

12. Special Problems. Largely laboratory work. *Three to eight hours.* Professors CAMPBELL and WHITE, Assistant Professors WARE and WHITE, Mr. BADGER, and Mr. RUE.
Open to those who have completed Courses 1, 2, 3 and 4, and Chemistry 28, with Course 5 and Chemistry 7 and 7a in addition if the subject involves organic chemistry. A reading knowledge of French or German (preferably German) is also required.
This course may be continued as Course 12a.
14. Machinery and Processes for Conveying, Drying, Calcining and Grinding. Lectures and recitations. *Two hours.* Assistant Professor WARE.
Open to those who have completed Courses 1, 2 and 3.
16. Gas Manufacture. Lectures and recitations. *Two hours.* Professor WHITE.
Open to those who have completed Course 5; or Course 2 in Chemical Engineering and Course 3 in Mechanical Engineering.
18. Metals and Alloys. Class and laboratory work. *Three to five hours.* Assistant Professor WHITE.
Open to those who have completed Course 1, and Course 5 in Chemistry or Course 2 in Engineering Mechanics.
21. Special Laboratory Work. *Five to eight hours.* This is research work along special lines. These courses are open only to graduates and seniors who receive special permission.
 - a. The Constitution of Steel. Professor CAMPBELL.
 - b. Hydraulic Cements. Professors CAMPBELL and WHITE.
 - c. Gas Manufacture and Purification. Professor WHITE.
It should be preceded or accompanied by Course 16.
 - d. Paints and Varnishes. Assistant Professor WARE.

NAVAL ARCHITECTURE AND MARINE ENGINEERING

FIRST SEMESTER

1. Naval Architecture. Structural Design. Lectures and recitations. *One hour.* Professor SADLER.
2. Naval Architecture. Ship calculation and strength. Lectures and recitations. *Two hours.* Professor BRAGG.
3. Naval Architecture. Stability and rolling of ships and preliminary design. Lectures and recitations. *Three hours.* Professor SADLER.
5. Naval Architecture. Mould loft and structural drawing. *Two hours.* Professor BRAGG.
6. Naval Architecture. Ship drawing and design. *Two hours.* Professor BRAGG.
8. Marine Boilers. Lectures and recitations. *One hour.* Professor BRAGG.

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9. Marine Engines. Lectures and recitations. *Two hours.* Professor BRAGG.
10. Marine Boiler design. *Two hours.* Professor BRAGG.

SECOND SEMESTER

2. Naval Architecture. Ship calculations and strength. Lectures and recitations. *Two hours.* Professor BRAGG.
4. Naval Architecture. Resistance and Propulsion of ships, and screw propellers. Lectures and recitations. *Three hours.* Professor SADLER.
5. Naval Architecture. Mould loft and structural drawing. *Two hours.* Professor BRAGG.
7. Naval Architecture. Ship drawing and design. *Three hours.* Professors SADLER and BRAGG.
9. Marine Engines. Lectures and recitations. *Two hours.* Professor BRAGG.
11. Marine Engine and Boiler Design. *Two or Three hours..* Professor BRAGG.

BOTH SEMESTERS.

Primarily for graduates.

12. Experimental Tank Work. *One, two or three hours.* Professor SADLER.
13. Ship and Engine Specifications. *One or two hours.* Professor SADLER.
14. Pumping and Ventilation. *One hour.* Professor SADLER.
15. Naval Architecture. Advanced reading. *Three hours.* Professor SADLER.
16. Advanced Drawing. *Three to five hours.* Professor SADLER.
17. Marine Engines. Advanced reading. *Three hours.* Professor BRAGG.
18. Marine Engines. Advanced drawing and design. *Three to five hours.* Professor BRAGG.

ARCHITECTURE

FIRST SEMESTER

1. Elements of Design. *Two hours.* Professor LORCH and Mr. KIMBALL.
An introductory course to the field of artistic design. Discussion of the principles of design and of the possibilities in design of line, color and form. The influence of material on design. Lectures, exercises in design and the study of examples.

4. Elements of Architecture. *Two hours.* Professor LORCH and Mr. KIMBALL.
The elements of architectural design. The plan, wall, roof; lintel, arch, vault, and dome; openings, mouldings; the orders. Lectures, drawing exercises and rendering in wash. This course must precede all architectural design courses. It should be preceded by Course 1 and must be preceded by Drawing 4a and 21.

Architectural Design

In the following courses in Architectural Design problems are assigned to be worked out in the drafting-room. Lectures are given from time to time bearing on the type of building then being designed. Study of the requirements of various classes of buildings and of the artistic possibilities of building materials; training of the student in composition in plan, section, elevation and perspective, in accurate draftsmanship and rendering in line, black and white and color.

Courses 5 and 10 inclusive constitute a progressive series of problems in architectural planning and design, advancing from the small building to the more important classes of buildings and to the group problem. The courses must be taken in the order given.

5. Architectural Design. *Three hours.* Professor LORCH and Assistant Professor ROBINSON.
The small ensemble. Course 5 should be preceded by Drawing 5a and 22 and by Courses 4 and 21 in Architecture.
6. Architectural Design. *Three hours.* Professor BOYNTON.
This course is a continuation of Course 5, should be preceded by Architecture 5 and 22.
7. Architectural Design. *Four hours.* Professor BOYNTON.
This course must be preceded by Architecture 6.
8. Architectural Design. *Five hours.* Professor BOYNTON.
This course must be preceded by Architecture 7.
9. Architectural Design. *Five hours.* Professor BOYNTON.
This course must be preceded by Architecture 8.
11. History of Architecture; Ancient. *Two hours.* Mr. KIMBALL.
The buildings of Egypt, Assyria, Persia, Greece, and Rome. Their historical conditions, building materials and methods, planning and design, and their sculptured and painted decoration and ornament will be studied by means of illustrated lectures, conferences, drawing exercises and research.
13. History of Architecture. The Gothic Architecture of France, England, Germany, Italy, and Spain. Illustrated lectures, conferences, drawing exercises, and research. *Two hours.* Assistant Professor ROBINSON.

15. General Course in the History of Architecture. *Two hours.*
The aim of this course is to give students seeking a liberal culture a survey of the development of the art of building. The temples, cathedrals, palaces and other characteristic monuments of the ancient, mediæval, renaissance and modern styles, their design, sculpture and painted decorations will be studied by means of lectures illustrated by the stereopticon, and collateral reading. This course is open to all students in the University, but cannot be counted towards graduation in architecture.
For students of art and archaeology desiring a more intensive study of the evolution of architecture, Courses 11, 12, 13 and 14 are recommended.
18. Architectural Composition. *One hour.*
This course supplements the courses in architectural design by a series of illustrated lectures.
22. Building Construction. Lectures, conferences, text-books, drawings and visits to buildings. Building materials and processes; working drawings; masonry construction; building stones, cements, concrete and brick, terra cotta, working drawings. *Two hours.* Mr. CONKEY, assisted by Mr. COHAGEN.
This course must be preceded by Drawing 4a.
24. Building Sanitation. *One hour.* Mr. MCCONKEY.

SECOND SEMESTER

1. Elements of Design. *Two hours.* Mr. KIMBALL.
An introductory course to the field of artistic design. Discussion of the principles of design and of the possibilities in design of line, color and form. The influence of material on design. Lectures, exercises in design and the study of examples.
4. Elements of Architecture. *Two hours.* Professor LORCH, Assistant Professor ROBINSON and Mr. KIMBALL.
The elements of architectural design. The plan, wall, roof; lintel, arch, vault and dome; openings, mouldings, the orders. Lectures, drawing exercises and rendering in wash.
This course must precede all architectural design courses; it should be preceded by Course 1 and must be preceded by Drawing 4a and 21.

Architectural Design

In the following courses in Architectural Design problems are assigned to be worked out in the drafting-room. Lectures are given from time to time bearing on the type of building then being designed. Study of the requirements of various classes of buildings and of the artistic possibilities of building materials; training of the stu-

dent in composition in plan, section, elevation and perspective, in accurate draftsmanship and rendering in line, black-and-white and color.

Courses 5 to 10 inclusive constitute a progressive series of problems in architectural planning and design, advancing from the small building to the more important classes of buildings and to the group problem. The courses must be taken in the order given.

5. Architectural Design. *Three hours.* Professor BOYNTON.
The small ensemble. Course 5 should be preceded by Drawing 5a and 22 and by Courses 4 and 21 in Architecture.
6. Architectural Design. *Three hours.* Professor LORCH and Assistant Professor ROBINSON.
This course is a continuation of Course 5, and should be preceded by Architecture 5 and 22.
7. Architectural Design. *Four hours.* Professor BOYNTON.
This course must be preceded by Course 6.
8. Architectural Design. *Five hours.* Professor BOYNTON.
This course must be preceded by Course 7.
9. Architectural Design. *Five hours.* Professor BOYNTON.
This course must be preceded by Course 8.
10. Architectural Design. *Eight hours.* Professor BOYNTON.
This course must be preceded by Course 8 or 9.
12. History of Architecture. The Early Christian, Byzantine and Romanesque Architecture of Italy, Byzantium, Central Syria, France and Germany, and Sassanian and Mohammedan Architecture. The historical conditions, building materials and methods, planning and design, and the sculptured and painted decoration and ornament will be studied by means of illustrated lectures, conferences, drawing exercises and research. *Two hours.* Mr. KIMBALL.
14. History of Architecture. The Renaissance Architecture of Italy, France, England, Germany, and Spain, the Classic Revival, and Architecture in the United States. Illustrated lectures, conferences, drawing exercises, and research. *Two hours.* Assistant Professor ROBINSON.
17. The Allied Arts of Design. Lectures, research, exercises in design. *Two hours.* Professor LORCH and Mr. KIMBALL.
Landscape architecture, mural painting, decorative sculpture, furniture, metal-work, glass, ceramics, and textiles.
21. Building Construction. Lectures, conferences, text-books, drawings and visits to buildings. *Two hours.* Mr. McCONKEY, assisted by Messrs. COHAGEN, WILLIAMS and COTTRELL.
Building materials and processes; primarily wood construction; working drawings.
This course must be preceded by Drawing 4a.

23. Building Construction. *Four hours.* Mr. McCONKEY.
Primarily steel construction; the plate girder; wood and steel trusses; a steel framed building. Conferences, working drawings.
This course is for students in Group I in Architecture and must be preceded by Courses 1 and 6 in Engineering Mechanics and Architecture 21 and 22.
 25. Building Details. *Two hours.* Professor BOYNTON.
Open only to senior students in Architecture.
 26. Building Construction. Conferences, working drawings, visits to buildings. *Four hours.* Mr. McCONKEY.
Steel and fireproof construction.
This course is for students in Group II in Architecture and must be preceded by Courses 11 and 12 in Engineering Mechanics and Architecture 21 and 22.
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SEQUENCE OF STUDIES.

The work of the first year in the four-year course leading to the degree of Bachelor of Engineering is the same for all students except those registered in Architecture and Architectural Engineering, who continue in the course chosen in the first year. At the end of the first year, all Engineering students elect either the civil engineering, the mechanical engineering, the electrical engineering, the chemical engineering, or the marine engineering course.

There is a limited opportunity for electives, as outlined in the description of the group system, and credit obtained in advance at entrance may leave a place for further elections. After the first year the student may take work to the amount of *eighteen hours* per week, as arranged by the classification committee; but *he may wisely, in some cases, take a smaller number of hours*, if he can in that way do more thorough work.

REQUIREMENTS FOR GRADUATION

THE DEGREE OF BACHELOR OF ENGINEERING OR OF ARCHITECTURE

To earn the degree of Bachelor of Civil, Mechanical, Electrical, Chemical, Marine or Architectural Engineering, or Bachelor of Architecture, the student must secure *one hundred and forty Hours of Credit** in a prescribed course of study, as given below, eight hours of which can be earned in one summer session. The diploma given indicates the line of study pursued. A time limit is not fixed; but four years and one summer session are usually needed for the work required for the degree.

Bachelors of Arts of this University and graduates of any other reputable college are excused from some portions of the general requirements, and are recommended for the same degree with the regular students upon completing the remaining requirements. This work can be done in two years, if the candidate has previously made considerable progress in mathematics and science. The culture imparted by classical or other liberal training will be found to have its uses for one engaged in technical work, and previous discipline of the faculties in exact research will enable the professional student to master more easily the requirements of the course. All the time the student can devote to general studies before taking up specialties will be well spent.

HOURS OF WORK REQUIRED FOR THE DEGREE OF BACHELOR OF CIVIL, MECHANICAL, ETC., ENGINEERING OR OF ARCHITECTURE.

SUBJECT.	Civil.	Mech.	Elect.	Chem.	Mar.	Arch. I.	Arch. II.	E.
English	5	5	5	5	5	5	8	5
Language and Free Electives....	16	16	16	16	16	16	16	16
Mathematics	18	18	18	18	18	13	4	18
Physics	10	10	19	10	10	8	8	10
Chemistry	8	8	8	30	8	4	0	4
Astronomy	2	0	0	0	0	0	0	0

* For explanation of the term Hour of Credit, and for further information about the courses prescribed for graduation, see Engineering Announcement.

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Geology	3	0	0	0	0	3	3	3
Mineralogy	2	0	0	0	0	0	0	0
Drawing	4	4	4	4	4	20	22	14
Shop Practice	4	12	8	4	4	4	0	4
Surveying	15	2	2	2	2	0	0	2
Engineering Mechanics	12	12	10	7	12	7	6	7
Civil Engineering	16	0	0	0	0	0	0	12
Mechanical Engineering	8	27	10	10	31-22	2	2	7
Electrical Engineering	0	4	26	4	4	1	1	4
Chemical Engineering	2	2	0	19	2	0	0	0
Marine Engineering	0	0	0	0	16-25	0	0	0
Architecture	0	0	0	0	0	43	46	27
Law	0	2	0	0	0	2	2	2
History of Art	0	0	0	0	0	3	3	0
Landscape Design	0	0	0	0	0	0	2	0
Office Work	0	0	0	0	0	0	8	0
Elective	15	16	16	11	8	9	9	5
Total	140	140	140	140	140	140	140	140

TWO YEAR COURSE FOR SPECIAL STUDENTS IN IN ARCHITECTURE

Special students in architectural design will take the following required courses (48 hours), the remaining 18 hours of work to be arranged in consultation with the Professor of Architecture.

Special students in building construction may omit five hours in design and two of freehand drawing and must complete the regular requirements for the courses in structural design.

Required Courses

Descriptive Geometry and Shades and Shadows (Draw. 4a)	4 hours
Perspective and Sterotomy (Draw. 5a).....	2 hours
Freehand Drawing, 4 courses.....	8 hours
History of Architecture, 4 courses.....	8 hours
Fine Arts, 1 course.....	3 hours
Building Construction, 2 courses (Arch. 21 and 22).....	4 hours
Architectural Design, 4 courses (including Arch. 1).....	15 hours
Building Sanitation, 1 course (Arch. 24).....	1 hour
Heating and Ventilation, 1 course.....	2 hours
Building Illumination (E. E. 7a).....	1 hour
	48 hours
Elective courses	18 hours
Total	66 hours

GRADUATE COURSES

Graduate work in Engineering and Architecture is offered in the Graduate Department of the University.

The following degrees are conferred: Master of Science in Engineering, Civil Engineer, Mechanical Engineer, Electrical Engineer, Chemical Engineer, Marine Engineer, Naval Architect, and Architect.

For details, see the chapter on the Graduate Department, or write to Dean KARL E. GUTHIE, for the special announcement of that Department.

FELLOWSHIPS IN CHEMICAL ENGINEERING

The Michigan Gas Association continues for the year 1913-1914 the support of the Fellowship in Gas Engineering which it has maintained since 1900. The annual stipend is five hundred dollars. The holder of the fellowship for the current year is Carl Kingsley Wirth, B.Ch.E.

The same Association has established a second fellowship whose holder receives two hundred and fifty dollars for one semester. The holder of this fellowship for the first semester of the college year 1913-1914 is Robert Hamilton Tennant, B.Ch.E.

The Acme White Lead and Color Works of Detroit continues for the year 1913-1914 the fellowship started by them in 1912. The annual stipend is five hundred dollars. It is held during the current year by John Crowe Brier, M.S.

SCHOLARSHIPS IN ARCHITECTURE

There are at present three scholarships for students of architecture, intended primarily for those just entering college. Preference is given to experienced architectural draftsmen and to students showing artistic ability.

FEES AND EXPENSES

The Matriculation Fee and the Annual Fee must be paid in advance. For the rules governing Second Semester fees and the refund of fees see page 95.

Matriculation Fee.—For Michigan students, *ten dollars*; for all others, *twenty-five dollars*.

Annual Fee.—For Michigan students, *fifty-seven dollars*; for all others, *sixty-seven dollars*. The annual fee required of all graduates who are granted the privilege of pursuing studies for an advanced degree *in absentia*, is *ten dollars*.

Graduation Fee.—For all alike, *ten dollars*.

Laboratory Courses.—The required laboratory courses cost approximately as follows: *Shop Practice.*—In the mechanical and electrical engineering course, *thirty dollars*; in the civil engineering course, *ten dollars*. *Physical Laboratory.*—A charge of *one dollar* is made for a course requiring one exercise a week during one semester, and at the same rate for the longer courses. *Mechanical Laboratory.*—The charge for each course is *five dollars*. *Chemical Laboratory.*—Students who take laboratory courses in chemistry are required to pay for the materials and apparatus consumed by them. The average cost of each course is about *ten dollars*. The fee required for any course has to be paid before the work of the course is begun.

Fee for Special Entrance Examination.—A fee of *five dollars* is required of all persons who present themselves for examination for admission at a date later than that announced in the Calendar.

The total amount of fees paid to the University during the whole four years' course, for matriculation, incidental expenses, materials used, and diploma, is, for Michigan students, from \$240 to \$280; and for others, from \$295 to \$335, varying more or less according to the student's actual laboratory expenses.

For additional information in regard to expenses, see page 93.

Department of Medicine and Surgery

A special announcement giving further information in regard to this Department is published annually. For copies of this Announcement; or for other information relating to the Department, address Dr. Charles W. Edmunds, Secretary of the Department of Medicine and Surgery, Ann Arbor, Michigan.

THE Department of Medicine and Surgery, for which provision was made in the legislative act by which the University was organized in 1837, was opened for students in 1850. The college year was lengthened from six to nine months in 1877. The course was lengthened to three years in 1880, and to four years in 1890.

The academic year extends from the Tuesday preceding the first Thursday in October to the last Thursday in June (September 29, 1914, to June 24, 1915). The lectures continue until the middle of June. The examinations are then begun, and concluded in time for the Commencement exercises.

For the summer session of this Department, see a subsequent chapter.

REQUIREMENTS FOR ADMISSION

The following will be admitted to the Department of Medicine and Surgery, as candidates for the Degree of Doctor of Medicine:

- I. (a) Those who hold the bachelor's degree from the Department of Literature, Science, and the Arts of this University, and
- (b) Graduates of collegiate departments of other universities, and

of approved colleges and scientific schools, holding the degrees of A.B., B.S., or Ph.B., provided they show evidence of having an acquaintance with Latin, and a fair reading knowledge of German or French, and can present credentials showing that they have had a year of collegiate work in Biology (Zoology and Botany), Chemistry (including Organic Chemistry) and Physics. Applicants holding post-graduate degrees, namely, A.M., M.S., Ph.D., and D.Sc., are subject to the same regulations.

II. Students registered on the combined course in collegiate and medical studies offered in this University, and who have followed this course as outlined, may enroll in the Department of Medicine and Surgery after having obtained 60 hours (B.S. and M.D. degrees) in the Department of Literature, Science, and the Arts, or 90 hours (A.B. and M.D. degrees), if they meet the other requirements. (See combined course in collegiate and medical studies).

III. Matriculate candidates for the bachelor's degree (a) of the Department of Literature, Science, and the Arts of this University, and (b) of the collegiate department of other universities, and of approved colleges and scientific schools, who can present evidence of being graduates of an approved high school, and in addition thereto can bring from the Dean of the Department of Literature, Science, and the Arts of this University a statement showing that they have completed the equivalent of 60 hours of credit in that Department will be admitted in case their credentials show an acquaintance with Latin and a fair reading knowledge of either German or French, and a year of collegiate work in Biology (Zoology and Botany), Physics and Chemistry, including Organic Chemistry.

No student therefore will be admitted to the school who has not completed two years of college work, in addition to graduating from an approved High School, or its equivalent.

In order to meet the requirements in Latin the applicant should have studied the language for two years and should have covered Latin grammar and at least four books of Caesar or their equivalent.

The requirement in German or French is met by two years of school work, for one not born to the language.

Applicants who are deficient in both German and French, but who fulfill the requirements in other subjects, may be admitted conditionally on the understanding that the condition be removed before the beginning of the second year.

Applicants who do not meet in full the requirements in Physics and Biology may enter the Summer Session preceding or following their first year of residence, and thus make up their deficiency, but the requirements in these subjects must be met before the beginning of the second year.

Unless the applicant meets in full the entrance requirements in Chemistry he will not be able to carry the full work of the freshman year.

COMBINED LITERARY AND MEDICAL COURSE

Students desiring to obtain the degrees of Bachelor of Arts in the Department of Literature, Science, and the Arts, and of Doctor of Medicine in the Department of Medicine and Surgery, may, by enrolling on the combined Literary and Medical course, shorten from eight years to seven the time required to earn the two degrees. This privilege is open only to students who throughout their course maintain a uniform record of good scholarship. The work is under the direction of a Committee of five members representing the Department of Literature, Science, and the Arts, and the Department of Medicine and Surgery. With the consent, of the Committee in charge, a candidate for the degree of Bachelor of Arts, who has been a student in the Department of Literature, Science, and the Arts for at least one year, and has 90 or more hours to his credit, of which at least 30 hours have been earned in the Department of Literature, Science, and the Arts in this University, may enroll upon the combined course; that is, while continuing his registration in this Department he may also register in the Department of Medicine and Surgery, provided the work he has already completed includes a sufficient number of the courses enumerated below to enable him to complete within one year the specified requirements described in the following paragraphs.

All students desiring to enter upon the Combined Literary and Medical Course must, in May of the year preceding the double registration, file with the Registrar of the Department of Literature, Science, and the Arts, on a blank to be obtained from him, a petition to be granted that privilege.

When the student so registered in the two Departments has completed the first year of the Course in Medicine, and not less than 90 hours in the Department of Literature, Science, and the Arts, he will be recommended for the degree of Bachelor of Arts, provided he has completed the requirements for graduation from the latter Department (See page 116), and provided his work has included the following courses:

Rhetoric, 6 hours, including Courses 1 and 2.

French and German, 16 hours of either one, and 8 hours of the other.

English, 6 hours.

Psychology, 6 hours.

Physics, 10 hours, including two hours of laboratory work.

Chemistry, General, Qualitative, and Organic, 12 hours for students presenting Chemistry for entrance, otherwise 16 hours.

Physical Chemistry, 4 hours.

Zoology, 10 hours.

Botany, 4 hours.

Total, 78 or 82 hours.

Suggested electives: Latin or Elementary Greek, 8 hours; History, or Political Economy, or Philosophy, 8 hours; Qualitative Analysis, 4 hours; Organic Chemistry, 5 hours.

Students who so desire, may obtain the Degrees of Bachelor of Science in Medicine and Doctor of Medicine in six calendar years by complying with the requirements above set forth, except that they must complete the first and second years of the course in Medicine and that the credit required from the Department of Literature, Science, and the Arts instead of 90 hours, shall be 67 hours before they may enroll upon the Combined Course and 75 hours before they receive the B.S. (in Med.) degree, and shall include the following courses:

Rhetoric, 6 hours, including Courses 1 and 2.

French or German, 16 hours.

Physics, 8 hours.

Chemistry, General, Qualitative, and Organic, 12 hours for students presenting Chemistry for entrance, otherwise 16 hours.

Zoology, 4 hours.

Botany, 4 hours.

Total, 50 or 54 hours.

Electives are suggested from the courses before mentioned.

Students taking the six-year course will ordinarily need to attend the Department of Literature, Science, and the Arts six and one-half years, or six years and two summer sessions. Those whose scholarship is sufficiently high may apply for permission to elect a limited number of extra hours.

Students who entered the Department of Literature, Science, and the Arts in the fall of 1913, or before, and who enroll upon the Combined Course in the fall of 1915, or before, are required to complete 60 hours in that Department.

ADMISSION TO ADVANCED STANDING

The applicant must have studied as a matriculated medical student, in an approved medical school for a period of time at least equal to that already spent by the class which he seeks to enter. He must present credentials showing that he meets in full the entrance requirements as herein set forth, and must furnish evidence showing that he has satisfactorily completed courses equivalent in amount and character to those given in this school, in the year or years preceding that to which he seeks admission and must pass examinations at the beginning of the session in all the subjects that have already

been pursued by the class which he desires to enter. Certificates of standing should be presented, but these cannot be accepted in place of these examinations.

COURSES OF INSTRUCTION

The regular course of instruction covers four years of nine months each. The first two years are devoted to the more fundamental scientific courses which serve as a basis for the technical and clinical studies which follow. Nearly the entire time of the first year is devoted to laboratory work. The forenoons of the remaining three years are devoted mainly to lectures and recitations, two or three each day; the afternoons to laboratory work, to clinical demonstration courses, and to clinics.

The following brief descriptions show the character and extent of the instruction given in the several branches during the current year, and indicate the order in which the different portions of the course are studied. Further details are given in the Special Announcement of the Department.

ANATOMY

1. Systematic Course in Anatomy of the Extremities. The course is repeated in periods of about eight weeks each. October to December, December to February, February to April. Mornings, 8 to 12. Professor STREETER and assistants.
2. Systematic Course in Anatomy of the Abdomen and Pelvis. Hours and instructors same as for Course 1.
3. Systematic Course in Anatomy of the Head, Neck, Thorax. Hours and instructors the same as for Courses 1 and 2.
4. Conferences in Anatomy. October to April, daily, 8 to 9. Professor STREETER, Dr. MCGARRY, and Dr. OTIS.
5. Regional and Topographic Anatomy. Six weeks. April to June, daily, 8 to 11. Dr. MCGARRY.
6. Surgical Anatomy. Second semester. One hour. Professor DARLING.
7. Laboratory Course in Anatomy for Dental Students. Twelve weeks. February to April, daily from 1 to 4. Dr. OTIS and assistants.
8. Descriptive Anatomy for Dental Students. Twelve weeks. October 15 to December, daily from 4 to 5. Dr. MCGARRY.

9. Comparative Anatomy of the Nervous System and Special Senses. Hours to be arranged with instructor. Professor STREETER.
10. Original Investigation. Professor STREETER.

HISTOLOGY AND EMBRYOLOGY

1. Embryology, Histogenesis, General Histology, Organology, and Anatomy of the Special Sense Organs and Nervous System. Daily from 1 to 5:30. October to March. Professor HUBER, Mr. GUILD and assistants.
- 1a. General Embryology, General Histology and Histogenesis, and Structure of the Elementary Tissues. Six weeks.
- 1b. Organology. Six weeks.
- 1c. Gross and Minute Anatomy of the Central Nervous System and Organs of Special Sense. Six weeks.
2. Lectures, Recitations and Laboratory Work in Histology for Dental Students. Twelve weeks. From March to June. Daily from 1 to 5. Professor HUBER, and Mr. GUILD.
3. Methods of Vertebrate Histology and Embryology. Hours arranged with instructor. Professor HUBER and Mr. GUILD.
4. Mammalian Embryology. Hours arranged with instructor. Professor HUBER.
5. Research in Vertebrate Histology and Embryology and in Anatomy of the Central Nervous System and the Organs of Special Sense. Hours arranged with instructor. Professor HUBER.

HYGIENE, BACTERIOLOGY, AND PHYSIOLOGICAL CHEMISTRY

1. General Hygiene. Lectures. Three times a week, second semester, second year. Professor VAUGHAN.
2. General Bacteriology. Lectures and quizzes. Daily, second semester, first year. Professor NOVY.
3. Practical Bacteriology. Laboratory work and recitations. Afternoons for twelve weeks, beginning early in March, first year. Professor NOVY, and Mr. BEHRENS.
This course is open only to Medical students who have had two years of college work, including organic chemistry.
- 3a. Practical Bacteriology. The same as Course 3, but open to students other than those eligible to Course 3. December to March. Professor NOVY and Mr. BEHRENS.
- 3b. Practical Bacteriology. For Dental students only. Eight weeks, 1 to 6, beginning the first week in October. Professor NOVY and Mr. BEHRENS.
4. Advanced Bacteriology. Professor NOVY.
Course 4 must be preceded by Course 3, or 3a. It is an optional course, and is open only to a limited number of students.

- 4a. The Pathogenic Protozoa. Continuation of Course 4. Professor NOVY.
5. Water Analysis. Chemical, microscopical, and bacteriological study of drinking water. Professor VAUGHAN and Mr. EMERSON.
6. Food Analysis. Chemical and bacteriological examination of food. Professor VAUGHAN, and Mr. PRYER.
Course 6 is open only to students specially qualified for the work.
7. Research Work on Hygiene Problems. Professors VAUGHAN and NOVY.
Course 7 is open only to students specially qualified for the work.
8. Physiological Chemistry. Lectures. Three times a week, first semester, second year. Professor VAUGHAN.
9. Physiological Chemistry. Laboratory work and recitations. Afternoons for nine weeks, second year. Professor NOVY and Mr. LUDLUM.
10. Advanced Physiological Chemistry. Afternoons for nine weeks. Professor NOVY and Mr. LUDLUM.
Course 10 is an optional course.
11. The Administration of Health Laws. Professor VAUGHAN.

PHYSIOLOGY

1. Physiology. Lectures, demonstrations, recitations. Five times a week, second semester, first year. Professor LOMBARD.
2. Physiology. Continuation of Course 1. Lectures, demonstrations, recitations. Five times a week, first semester, second year. Professor LOMBARD.
3. Practical Physiology. Laboratory work. Afternoons for nine weeks, second year. Professor LOMBARD and Dr. COPE.
4. Advanced Work in Physiology. Professor LOMBARD.
Course 4 is open only to students who have completed Courses 1, 2, and 3, or an equivalent amount of work.
5. Research Work. Professor LOMBARD.

PATHOLOGY

1. General Pathology. Four times a week, first semester, three times a week, second semester, second year. Professor WARTHIN.
2. General Pathology. Laboratory work. Afternoons for nine weeks, second year. Professor WARTHIN and Dr. WELLER.
- 2a. Journal Club. Third year. Professor WARTHIN.
Course 2a is elective and is open only to students who receive special permission.
3. Special and Gross Pathology. Gross pathological anatomy. One hour a week, third year, in addition to time taken for clinical autopsies. Professor WARTHIN.

4. Autopsies. Professor WARTHIN and Dr. WELLER.
5. Pathology of the Female Genito-Urinary Organs. Elective. Professor WARTHIN and Dr. WELLER.
6. Pathological Physiology. Professor WARTHIN and Dr. WELLER.
7. Graduate Course. Professor WARTHIN.

PHARMACOLOGY AND THERAPEUTICS

1. Pharmacology. Lectures, demonstrations, recitations. Three times a week, second semester, second year. Professor EDMUNDS.
2. Pharmacology. Lectures, demonstrations, recitations. Three times a week, first semester, third year. Professor EDMUNDS.
- 2a. Pharmacology and Therapeutics. Two times a week, second semester, third year. Professor EDMUNDS and Dr. MARSHALL.
3. Experimental Pharmacology. Second Semester, second year. Professor EDMUNDS and Dr. MARSHALL.
4. General Therapeutics. Two times a week, first and second semester, fourth year. Dr. MARSHALL.
5. Research Work in Pharmacology. Third and fourth years. Professor EDMUNDS.
6. Practical Anaesthesia. Dr. MARSHALL and Miss DAVIS.

SURGERY

1. Principles of Surgery. Lectures, recitations, and text-book. Twice a week, third year. Professor DE NANCREDE and Dr. WALDRON.
2. Diagnostic Clinic. Once a week, second semester, third year. Professor DE NANCREDE.
3. Demonstration Course in Operative Surgery. Third year. Dr. GEORG.
4. Oral Surgery. First semester, third year. Surgical Instruments—second semester, third year. Professor DARLING.
5. Special Surgery. Lectures and recitations. Three times a week, fourth year. Professors DE NANCREDE, DARLING and LOREE, and Dr. WASHBURNE.
6. Surgical Clinics. Fourth year. Professors DE NANCREDE, DARLING, LOREE, and assistants.
7. Ward Classes. Fourth year. Professors DE NANCREDE, DARLING, and LOREE, and Dr. WASHBURNE.

INTERNAL MEDICINE AND DISEASES OF CHILDREN

1. Physical Diagnosis. Introductory course. Two hours a week, second semester, second year. Dr. AGNEW.
2. Clinics and recitation. Five hours a week, third year. Professor HEWLETT and Dr. SCHMIDT.
3. Physical Diagnosis. Every afternoon, for eight weeks, third year. Dr. WILSON.

4. Clinical Microscopy. Afternoons, daily for eight weeks, third year. Dr. AGNEW.
5. Clinical Physiology of the Circulation. Optional course. Second semester, third year. Professor HEWLETT.
6. Case Taking. Patients are assigned to members of the class, who take the history, work out the present condition, and write the results, with differential diagnosis, prognosis, and plan of treatment. Fourth year. Professor HEWLETT, and assistants.
7. Clinical Lecture and Conference. Twice a week, fourth year. Professor HEWLETT.
8. Chemistry of Milk and Digestion. Laboratory work, fourth year. Professor COWIE and Mr. DRURY.
9. Lectures on Diseases of Children. Once a week, senior year. Professor COWIE and Mr. DRURY.
10. Clinic in Pediatrics. Once a week, fourth year. Professor COWIE.
11. Advanced Work in Chemistry of Milk and Digestion. Professor COWIE.

DISEASES OF THE MIND AND NERVOUS SYSTEM

1. For third-year students. Twelve exercises, each of two hours. Laboratory work in the pathological anatomy and physiology of the nervous system. Professor BARRETT.
2. Lecture and Recitation Course. One hour each week throughout the year. For students of the third year. Professor CAMP.
3. Clinical Lecture. Two hours each week throughout the fourth year. Professor CAMP.
4. Psychiatry. A clinical lecture course given one and one-half hours each week throughout the fourth year. Professor BARRETT.
5. Ward Class. Two hours daily for the fourth-year class. Professor CAMP and Dr. KLINGMAN.
6. Ward Class in Psychiatry. Professor BARRETT.
7. Laboratory Work in Neural Pathology. Professor BARRETT.
8. Laboratory Work in Experimental Psychology. Professors BARRETT and PILLSBURY.

OPHTHALMOLOGY

1. Lectures and Recitations. Fourth year. Professor PARKER.
2. Clinical Lectures. Fourth year. Professor PARKER.
3. Demonstration Course. Twice a week, for eight weeks, third year. Dr. SLOCUM.

OTO-LARYNGOLOGY

1. Lectures and Recitations. Fourth year. Professor CANFIELD.
2. Clinical Course. Fourth year. Professor CANFIELD.
3. Demonstration Course. Twice a week, for eight weeks, third year. Professor CANFIELD and Dr. LORIE.

OBSTETRICS AND GYNECOLOGY

1. Theory of Obstetrics. Lectures, recitations, clinical conferences. Two times a week, first and second semesters, third year. Professor PETERSON, Dr. DEWITT, Dr. SEELEY, and Dr. LOOMIS.
2. Demonstration Course in Obstetrics. Three times a week for eight weeks, third year. Dr. DEWITT and Dr. SEELEY.
3. Gynecology. Lectures, recitations. One hour a week, third year. Professor PETERSON.
4. Obstetrics and Gynecology Clinic. Two hours a week, fourth year. Professor PETERSON.
5. Practical Obstetrics. Small sections. Fourth year. Drs. DEWITT and SEELEY.
6. Obstetrics and Gynecology. Diagnostic Clinic and Ward Class. Two hours a day for six weeks. Professor PETERSON and assistants.

DERMATOLOGY AND SYPHILOLOGY

1. Clinical lectures and conferences, one and one-half hours a week. Fourth year. Professor WILE.
2. Ward Class. Five hours a week. Fourth year. Professor WILE and Dr. HOLMES.
3. Recitations, clinic and lantern slide demonstration, one hour a week, second semester. Third year. Professor WILE and Dr. HOLMES.

MEDICAL JURISPRUDENCE AND TOXICOLOGY

1. Lectures from the legal standpoint. Second semester, fourth year. Mr. LIGHTNER.
2. Lectures from the medical standpoint. Second semester, fourth year. Professor VAUGHAN.

BEDSIDE AND DISPENSARY INSTRUCTION

Senior students are given charge of patients, and are required to make diagnosis, prescribe, dress wounds, and perform minor operations under the direction of the professor in charge. A lying-in ward furnishes obstetrical cases, which are attended by the senior students in rotation.

COURSES IN PUBLIC HEALTH

Courses in Public Health are given in the Graduate Department, leading to the degrees of Master of Science in Public Health and Doctor of Public Health.

The greatest movement of the present time is that for the prevention of disease and the conservation of human life and health. This has resulted in a great campaign of education of laymen in matters of hygiene and sanitation, and as a natural development out of this educational movement there has come an ever growing demand for the services of men properly trained as public health officers. The next decade will see a tremendous development of public health organization in the United States; and to meet this there must be made available a body of men educated in public health work. In this education of public health officers the State University finds an especially appropriate field, as no other matter more closely touches the lives and happiness of the citizens of the State. It is with this view-point that the University of Michigan offers these courses.

RULES CONCERNING EXAMINATIONS

1. Examinations (either written or oral, or both), will be held at the close of each course or semester. The result of each examination must be reported in writing and within ten days to the the Secretary of the Faculty by the professor in charge.

2. A student may be marked **PASSED**, **INCOMPLETE**, **CONDITIONED**, **ABSENT**, or **NOT PASSED**. A student reported **INCOMPLETE** may apply for examination or re-examination in the same subject at the close of the next course or semester or at a time set by the professor in charge, provided he has completed the work of the course. A student reported as **CONDITIONED** can apply for re-examination in the same subject at the close of the next course or semester, or at the next officially announced time for the removal of conditions. Examinations for the removal of conditions are held during the first week of the session and immediately after the Christmas and spring vacations. A student reported as **ABSENT** may at the discretion of the professor in charge be given a special examination or comply with the rule governing the removal of conditions. A student reported as **NOT PASSED** cannot apply for re-examination until he has again taken the course in which he has failed.

RULES COVERING THE ADVANCEMENT AND CLASSIFICATION OF STUDENTS

1. No student who carries two or more conditions or re-conditions in the lecture or recitation work of the preceding year is permitted to carry the full lecture or recitation work of any one year after the fall examinations for the removal of conditions. The lec-

ture or recitation work of such a student shall be reduced an equivalent number of hours. A student having one condition or re-condition in a lecture or recitation course after the fall examinations for removal of conditions shall have his work arranged by the Faculty.

2. A student conditioned in more than two lecture or recitation courses at the end of the first semester of any one year shall be placed on probation and his work reduced in proportion to the courses in which he failed or received conditions.

3. A student marked conditioned or incomplete in two laboratory courses shall not be assigned to further laboratory work until he has completed the laboratory courses in which he is marked incomplete or conditioned.

4. All conditions not passed within one year become "Not Passed."

5. Candidates for graduation failing in an examination will be allowed a re-examination before the entire Faculty, and failing in this, such students may again present themselves for examination at the expiration of a time which shall be determined by the Faculty, but which shall not be less than three months, nor longer than twelve months.

6. No student will be recommended for graduation until all his required work is completed and all his examinations passed.

INSTRUCTION FOR WOMEN

The course of instruction for women is in all respects the same as for men. It has been found in this and other of the better medical schools that both sexes may attend with propriety and at the same time the various laboratory courses, including Practical Anatomy, the lecture courses, as also the sectional and public clinics.

REQUIREMENTS FOR GRADUATION

To be admitted to the degree of Doctor of Medicine, a student must be twenty-one years of age, and possess a good moral character. He must have completed the required courses in laboratory work, and have passed satisfactory examinations on all the required studies included in the full course of instruction. He must have pursued the study of medicine for a period of four years and have attended four full courses of medical lectures, the last two of which must have been in this Department.

Graduates of other reputable medical colleges, wishing to take a degree in this school, must regularly matriculate and do all work required in this school and not required in the school that has granted the diploma already held. The shortest term of residence for such graduates is one year. Graduates of other reputable medical schools may, however, without becoming candidates for a degree, pursue any of the graduate courses on the conditions stated below.

GRADUATE COURSES

(See the chapter on the Graduate Department.)

The rapid development of medical science has necessitated the introduction of many new subjects into the curriculum, and this leads practitioners, who wish to keep abreast of the times, to return to the University in order to take special courses in the newer subjects. Moreover, at the present time some of the laboratory and demonstration courses mentioned in the preceding schedules are not given in many American medical colleges, and there have been frequent requests for admission to these courses from graduates of such schools. The frequency of these requests has led the Board of Regents to authorize the Faculty to admit medical graduates to any one or more of the regular courses when such candidates give evidence of their ability to profit by such instruction. In such cases the graduate student must pay ten dollars tuition for each course taken in addition to the ordinary laboratory expenses of such course.

Graduate work is also offered to students who have taken the full required courses.

MUSEUMS AND LABORATORIES

For further information in regard to the University museums, laboratories, libraries, and gymnasiums, see pages 53.

ANATOMICAL COLLECTION

The museums of the late Professors FORD and SAGER, including several thousand specimens, the result of many years' labor in collecting and preparing material intended to aid directly in teaching, are now the property of the University. Other preparations are constantly being added, and the museum now contains a valuable collection of bones, illustrating abnormal as well as normal conditions and the various changes that occur from infancy to old age; dissections, general and partial, of the vascular, nervous and muscular systems; series of sections made of frozen bodies; preparations illustrative of visceral and other anomalies; models of various organs and portions of the body in wax, papier-maché and plaster, and preparations and models illustrating the phenomena of human and comparative embryology and neurology.

The collection contained in the University Museum and the valuable osteological and odontological collections in the museum of the Dental Department are also open to the inspection of students.

MUSEUM OF PATHOLOGY

The laboratory of pathology contains a very complete and well-arranged pathological museum with many rare and valuable specimens, utilized for teaching purposes.

MUSEUM OF MATERIA MEDICA

The museum of materia medica consists of a fairly complete collection of the crude substances used in medicine, along with their principal preparations and active principles. In the arrangement of the drugs into groups convenient for study, importance is attached not to their origin but to their action. The museum is also provided with several works of reference for use of students, and with a number of graphic registrations of the action of drugs. It is open to students of the junior class at such hours as they arrange with the instructor.

MUSEUM OF NATURAL HISTORY AND LIBRARY

Students in medicine have access to the botanical, zoological, and geological cabinets of the University, estimated to contain 255,000 specimens. The Medical Library contains about 21,000 volumes and 425 pamphlets, exclusive of about 8,000 volumes treating of chemistry, pharmacy, and allied subjects of importance to medical students, included in the General Library, which contains 222,386 volumes, and is open to all students. A complete catalogue, arranged both by authors and by subjects, is accessible to readers. The leading medical periodicals of this country and of Europe, 337 in number, are taken and kept on file.

ANATOMICAL LABORATORY

The laboratory of anatomy is situated on the third floor of the new laboratory building and contains four well lighted and well ventilated dissecting rooms. A study room is provided for the convenience of the students, as also rooms for research and for special dissections, both comparative and human.

The laboratory possesses an osteological loan collection, and students are permitted to withdraw sets of bones illustrative of human osteology, which they may retain during their stay in the anatomical laboratory.

PHYSIOLOGICAL LABORATORY

The apartments provided for the physiological laboratory offer excellent facilities for practical work, whether of class instruction or of original investigation. Large and well-lighted rooms are appropriated to the use of undergraduate students, who perform under the direction of instructors most of the fundamental physiological experiments. The subjects commonly embraced in the practical course relate to the physiology of muscle and nerve, reflex action, circulation, respiration, and digestion. Smaller rooms are devoted to advanced work and original investigation. The laboratory has a good supply of apparatus, tools, etc., and is open daily for physiological experiment and research.

HISTOLOGICAL LABORATORY

The histological laboratory is on the second floor of the medical building. It provides facilities for elementary and for advanced work in histology and histogenesis. There is a large room, accommodating forty-five students, for the elementary work in histology, and a smaller room, accommodating twenty students, for the elementary work in vertebrate embryology, together with storage rooms, a room in which a reference library is shelved, and private rooms for the use of the professor in charge and his staff. Suitable provision is made for students and graduates who desire to engage in the work of research. The laboratory equipment includes the apparatus and instruments needed for conducting the elementary work in histology and embryology, and for special research. An excellent collection of the Ziegler embryological models and of models of various glands and other minute anatomic structures made after the Born method of wax plate reconstruction and of corrosion preparations facilitates the work of instruction in the courses of histology and embryology. Every encouragement is given students and other persons of sufficient preliminary training to undertake the investigation of special problems.

PHARMACOLOGICAL LABORATORY

The pharmacological laboratory, which for a number of years has been located in the old medical building, has been transferred to the newer part of the old chemical building, which has been completely remodeled in order to make it suitable for this work. The changes which have been made make it admirably adapted for the purpose, as ample room for work along chemical lines as well as along those of experimental pharmacology.

The laboratory is well supplied with apparatus and material for original work in this branch of research, and any student or graduate receives every encouragement in the prosecution of such work.

PATHOLOGICAL LABORATORY

The first floor on the east side of the medical building and rooms in the basement are occupied by the pathological laboratory. Increased facilities are now afforded for graduate work and for work in research. A special room is also assigned to work in gynecological pathology.

The laboratory is supplied with microscopes, microtomes, paraffin ovens, and the other apparatus necessary in the study of pathologic histology. Each student is furnished with a locker containing a microscope with high and low powers, and is assigned to a table containing the necessary stains and reagents for practical work. These are furnished by the laboratory.

The supply of material for the study of pathologic histology is the result of collections made in the pathological institutes of Vienna and Dresden, and embraces almost every known pathologic condition. This collection gives ample material for the regular courses, and, in addition, offers special opportunities to the advanced student who may wish to pursue studies in certain lines of special pathology, as the pathology of the nervous system, genito-urinary tract, skin, etc. In addition, an abundant supply of fresh material comes from the clinics of the University Hospital, and this is utilized to the fullest extent in the teaching both of gross and of microscopic pathology. The laboratory is fitted with a Bausch and Lomb carbonic acid freezing microtome for use in the making of quick diagnoses and in the preparation of fresh material for class study.

HYGIENIC LABORATORY

The hygienic laboratory, established by a special appropriation of the legislature in 1887, and opened for work January, 1889, is located in commodious quarters in the medical building. The facilities for original research have been enlarged, and from twenty to thirty students in research can be accommodated at once. Special rooms have been fitted up for the chemical, microscopical, and bacteriological study of foods and drinks, and for the prosecution of investigations in the chemistry and action of bacterial and other toxins. With the large incubating tanks now in use, it is possible to obtain a cellular substance of bacteria in large amounts.

PASTEUR INSTITUTE

The Pasteur Institute was established as a department of the hygienic laboratory in April, 1903. During the years 1903 to 1912 inclusive 825 cases of hydrophobia were treated at this institute. Residents of Michigan are treated at a charge of \$25.00 and they must provide their own room and board. Persons from other states are charged one hundred dollars for each treatment. The institute gives opportunity for all medical students to become practically familiar with the procedure necessary in the treatment of rabies.

BACTERIOLOGICAL LABORATORY

The west half of the second floor of the medical building, containing about 7,000 square feet of floor space, is devoted to work in bacteriology. The two main laboratories contain seventy-eight desks, used by beginners and by advanced students. All the material required for the work is supplied, practically at cost, from a well-stocked dispensing room. Four rooms are devoted to the research work of the professor in charge, his assistants, and others qualified to carry on special studies. An incubating room, main-

tained at a constant temperature, is provided with individual drawers for the use of students. A similar room is reserved for the work in research. A cold room, including a spacious refrigerator, is cooled by means of a liquid carbonic acid plant in such a way that the refrigeration can be kept at, or below, the freezing point, while the temperature of the room itself is maintained at about 60F. A special compartment of 1,000 cubic feet capacity is reserved for experimental disinfection. Provision is made for operative work on animals, cremation of infected material, sterilization of cages, etc. The well-lighted ground floor contains the store rooms and animal rooms and, in addition, a large room for microphotography. Gas, water, steam, and compressed air are supplied to the hoods in every work room. The laboratory is equipped with apparatus and instruments of the best make.

LABORATORY OF PHYSIOLOGICAL CHEMISTRY

This laboratory is in the west half of the third floor of the medical building, and occupies about the same floor space as the bacteriological laboratory above described. The two rooms for the elementary and the advanced work are provided with sixty desks. An adjoining room is equipped with balances and microscopes. A preparation room, contains, among other things, a distilling plant from which the water is taken in pipes to different parts of the building. Special rooms are provided for the instructor and for research. There are also well-equipped rooms for combustions, for optical work, and for gas analysis. In every room there are spacious hoods with fittings for steam and compressed air in addition to gas and water. By an elaborate system of fan ventilation, the air in the laboratory is renewed every fifteen minutes. A small lecture room is in direct connection with the laboratory.

THE UNIVERSITY HOSPITAL

The University Hospital has the great advantage of being a hospital instituted primarily for teaching purposes, as all who are admitted are utilized freely for instruction. There are few hospitals where this is carried so far, the only restriction being the possibility of doing the patient harm. It may be well to emphasize this fact, as it has formed a distinct feature of this hospital since its beginning in 1869, when a large dwelling house, situated on the campus, was converted into a hospital, giving accommodation to about twenty patients, and in its further growth this feature has been maintained and developed. The hospital now embraces a central building erected in 1891, one office building, completed in 1896, a

small isolation hospital added in 1898, a western building or pavilion acquired in 1901, a large addition known as the "Palmer Ward," and a central heating plant, containing the laundries, completed in 1903, and a psychopathic hospital. An eye and ear ward, to accommodate forty patients has just been completed. The hospital now has about 300 beds and contains two clinics amphitheatres, clinical laboratories, and a room for X-ray diagnostic work and X-ray therapy. A nurses' home, erected and completed in 1898, forms another of this group of buildings. The whole hospital is under the supervision of the Faculty and under the immediate direction of the hospital committee, consisting of the clinical teachers, who attend regularly upon the patients (each upon such cases as come regularly within his special department), and give the clinical instruction. Clinics are held every day during the college year and during the summer session for medical, surgical, gynecological, ophthalmological, and venereal cases, at which time examinations are made, prescriptions given, and surgical operations performed in the presence of the classes or of sections thereof.

The patients are assigned to students who take the histories of the cases, make the physical examinations, the diagnosis and prognosis, and suggest the line of treatment or operative procedure thought necessary, this under the direction of the professor in charge. The clinical laboratories under the direction of the departments of internal medicine, surgery, gynecology, and nervous diseases, all of which are especially equipped, furnish facilities for the scientific study of cases and are freely used by students as time and space permit. Stress is laid upon the value of ward and bedside instruction. The character of the hospital is such that this mode of instruction can be carried out more fully and more systematically than in many hospitals available for teaching purposes; this justifies the statement that the practical hospital work the students of this department are able to do is not yet given in many medical schools. Without detracting in any manner from the benefit which the patient may receive, it may be stated that much of the work of giving treatment, of dressing wounds, and of giving other detailed attention to patients is carried out, under proper supervision, by senior students. For the treatment of diseases of the nervous system, the hospital is furnished with apparatus for generating all kinds of electrical currents. A lying-in ward is established in which senior students are given an opportunity to attend cases of labor and become familiar with the duties of the lying-in room, under the immediate direction of the professor of obstetrics and his assistants. A large number of the cases submitted to the hospital are from a distance, and are of more than common interest, including numerous surgical and gynecological cases requiring major operation, many cases of disease of the lungs, heart, blood, digestive system, kidneys, and the nervous system. The eye, ear, nose, and throat service is large and replete with instructive cases. Patients with contagious

diseases are treated in the isolated hospital. The expenses to patients are only for their board, for unusual appliances or for special nursing, and for medicines, the services of the clinical teachers of the Faculty being rendered gratuitously to those made available for clinical instruction.

Patients who desire to enter the hospital are requested to write to J. BRADFORD DRAPEK, Superintendent of the University Hospital, Ann Arbor, Michigan, to ascertain if there is room for their accommodation and to obtain a circular giving more fully the rules governing admission.

Training School for Nurses.—In connection with the hospital a training school for nurses has been established under the charge of a competent and experienced matron. The term of study and service extends through three years, at the expiration of which time those who have proved themselves worthy are granted a certificate of graduation. For further information in regard to the school application may be made to the Superintendent of the Hospital.

Psychopathic Hospital.—The legislature of the State of Michigan, with a wise conception of the needs of those afflicted with mental disorders, and with a high appreciation of the advances of modern medical research, made provision for an addition to the University Hospital of a ward especially equipped for the care of a limited number of acute cases of insanity. This was done with the view of furnishing an opportunity for the more thorough study of the conditions attending insanity in its incipient stages, and with the hope that, by the aid of specialists in all branches of medicine and surgery, and the laboratory facilities available at the University Hospital, there might result the discovery of causes of these diseases at present time, unknown, and the development of methods of treatment that might increase the number of cures. The advantages to the medical student of such an addition to our hospital are apparent to all.

MEDICAL BUILDINGS

The medical building, completed in 1903, measures 175 by 145 feet, with an interior court, measuring 75 by 45 feet, and has a high basement and three upper stories. It provides accommodation for the departments of hygiene, bacteriology, physiological chemistry, pathology, anatomy, histology, and embryology. It contains, further, two large amphitheatres, two lecture rooms, a faculty room, and the offices of the Dean and the Secretary.

The departments of physiology and pharmacology have been provided for in the north wing of the building vacated by the department of chemistry. This building has been entirely rebuilt and refurnished, and in addition to the large laboratories for general student use, there are also smaller rooms for the accommodation of assistant and research students.

BEQUESTS

The Elizabeth H. Bates Bequest.—In the spring of 1898, Dr. Elizabeth H. Bates, of Port Chester, N. Y., died leaving to the Medical Department an estate valued at about \$140,000. Dr. Bates was in active practice for many years. She took a deep interest in the medical education of women, and the bequest may be looked upon as a recognition by her of the successful efforts made by the University of Michigan to give to women medical instruction equal to that furnished men. In accordance with a provision of the will the title of Bates Professor of Diseases of Women and Children has been given to Dr. Reuben Peterson. (The didactic and clinical work in connection with children's diseases are in charge of the chair of Internal Medicine, as heretofore.)

The Treadwell Bequest.—The late Mrs. Edward Treadwell, of Ann Arbor, bequeathed to University Hospital the sum of \$2,000.

The Davis Bequest.—The late Mrs. Davis, of New Castle, Ind., made the University Hospital and the Ann Arbor Society for the Prevention of Cruelty to Animals her residuary legatees. The value of this bequest is about \$2,000.

The Palmer Bequest.—Mrs. Palmer, widow of Professor Alonzo B. Palmer, formerly Dean of this Department, left the sum of thirty-five thousand dollars to the Hospital, and the "Palmer Ward" has been erected and equipped as a memorial to this distinguished pioneer in American medicine.

TEXT-BOOKS AND BOOKS OF REFERENCE

Lists of text-books and books of reference recommended are given in the special Announcement of the Department.

RULES GOVERNING PARTICIPATION IN PUBLIC ACTIVITIES

For the rules governing participation in public activities see page 83.

FEES AND EXPENSES

The matriculation fee and the Annual Fee must be paid in advance, and no student can enter upon his work until after such payment. For the rules governing Second Semester fees and the refunding of fees see page 95.

Matriculation Fee.—For Michigan students, *ten dollars*; for all others, *twenty-five dollars*.

Annual Fee.—For Michigan students, *fifty-seven dollars*; for all others, *sixty-seven dollars*.

Graduation Fee.—For all alike, *ten dollars*.

Laboratory and Demonstration Courses.—The required laboratory and demonstration courses cost approximately as follows:

Anatomy	\$21 00
Bacteriology	15 00
Physiological Chemistry	15 00
Histology	10 00
Physiology	5 00
Pharmacology	5 00
Pathology	10 00
Operative Surgery	10 00
Demonstration Course in Internal Medicine	10 00
Demonstration Course in Obstetrics	10 00
Demonstration Course in Nervous Diseases	10 00
Demonstration Course in Ophthalmology	5 00
Demonstration Course in Oto-Laryngology	5 00

A deposit of the amount indicated in each case is required before the work of the course is begun.

Practitioners' Courses.—A fee of *ten dollars* is charged to graduate students for each course taken, in addition to the ordinary laboratory expenses of the course.

The total amount of fees paid to the University during the whole four years' course for matriculation, incidental expenses, materials used, and graduation is, for Michigan students, about \$350.00, and for all others, about \$400.00, varying a little with the students' actual laboratory expenses.

For additional information in regard to expenses, see page 93.

Department of Law

A special Announcement giving further information in regard to this Department is published annually. For copies of this Announcement, or for other information relating to this Department, address Professor H. M. Bates, Dean of the Department of Law, Ann Arbor, Michigan.

The Department of Law was organized in 1859. Its growth and influence have been marked. From the beginning it has been the purpose of the Faculty to afford facilities for the best legal training and to keep step with every advance in the cause of legal education. The Faculty is composed of both resident and non-resident members. The resident members, sixteen in number, devote themselves regularly and continuously to the work of instruction. In addition to the instruction by the resident staff, which covers all the fundamental and ordinary branches of the law, provision is made for several courses by specialists upon such subjects as international law, comparative constitutional law, constitutional history, admiralty law, legal ethics, mining law, irrigation law, patent law, copyright law, trademark law, and statute law.

The Department occupies a spacious building, devoted exclusively to its use. It is ample in its accommodations, and well adapted for law-school work.

The academic year extends from the Tuesday preceding the first Thursday in October to the last Thursday in June (September 29, 1914, to June 24, 1915).

For information concerning the summer session of the Department, see a subsequent chapter.

DIRECTION TO APPLICANTS FOR ADMISSION

Before admission to the Department, or to the entrance examination, the applicant is required to present to the Dean the Treasurer's receipt for payment of the matriculation fee and the annual fee. It is essential, therefore, that he apply first to the Secretary at his office in the Law Building, register his name as a student in the Department of Law, and pay his fees to the Treasurer of the University. He is then entitled to apply for admission. In case of rejection, the money paid preliminary to the examination is refunded by the Treasurer.

REQUIREMENTS FOR ADMISSION

Applicants for admission to the first year class must be at least nineteen, to the second year class, twenty, and to the third year class, twenty-one years of age. Applicants for admission to the fourth-year class or as special students must be at least twenty-one years of age. Every applicant for admission, whether as a regular or as a special student, must present a certificate of character. This may be in the form of a certificate of graduation, or of honorable dismissal from the school with which the applicant was last connected, or, in the case of special students who cannot present these, in the form of a general letter as to character.

WHEN STUDENTS MUST ENTER

Students may enter at the beginning of either semester or of the Summer Session, but for students not entering upon advanced standing, a full three years of residence is required to complete the course. For this purpose three Summer Sessions count as one year. In any case students are expected to enroll at the opening of the session. Those who enter late necessarily lose much of the work, and absences at that time are treated like other absences in reducing the number of hours of credit that may be earned. In no event can students who present themselves more than a month after the opening of any session be permitted to work for credit toward graduation during that session.

Candidates for advanced standing must present themselves for examination one week before the opening of the Department.

ADMISSION AS CANDIDATE FOR A DEGREE

Graduates of approved universities or colleges and students who, in addition to an academic or high school course of four years, have completed one full year of work in an approved university or college, are admitted to the Department as candidates for the degree.

The Department does not specify any particular subjects which must be taken during the required year of college work. In general, students are advised to take such courses as are ordinarily taken in the first year, by candidates for the degree of A.B. in the Department of Literature, Science, and the Arts of this University or in other colleges or universities of high rank. Work of high school or academic grade taken during the college year will not be accepted as meeting the requirement of a college year. College courses in which there are unremoved conditions or other deficiencies will not be accepted.

In all cases the applicant should present to the Dean of the Department, before the time of application for admission, evidence that he comes within some one of the classes named. This, in the case of a university or college graduate, should be in the form of a certificate of graduation; in the case of other applicants, in the form of a certificate showing in detail the conditions of admission and the university or college work accomplished, and including an honorable dismissal signed by the proper authority. *A diploma will not be accepted as evidence of the completion of the required work.* Blank forms for the certificate will be furnished upon application. These, when filled out, should be mailed to the Dean of the Department at the earliest possible time. *The applicant will save time and prevent inconvenience and possible confusion by filing his credentials before September first.*

The one year of college or university work now required for admission to the Department of Law is entirely distinct and separate from law work and cannot be taken in the Department of Law. It must be pursued in the Department of Literature, Science, and the Arts of this University, or in some other approved college or university.

Beginning with the academic year 1915-16 only such persons as have completed two years of college work in an approved college or university will be admitted as candidates for a degree.

All students planning to pursue this required college work in this University preliminary to entering the Department of Law should make their applications for admission to the Dean of the Department of Literature, Science, and the Arts. Students who have taken their college work in other colleges or universities, should make their applications for admission directly to the Dean of the Department of Law.

ADMISSION OF SPECIAL STUDENTS

Persons who are more than twenty-one years of age, but whose preliminary training has not been sufficiently extensive to satisfy the requirements for admission as regular students, may, in exceptional cases, be admitted as special students. They must first, however, file with the Dean recommendations as to character and ability which satisfy him that they are qualified to pursue work in

the Department with profit to themselves, and they will be required to pursue and complete the courses to which they are admitted with the same thoroughness as regular students. The entry of special students is not encouraged. Applicants for admission under this rule must submit to the Dean evidence of the possession of general education, maturity, experience, and exceptional ability that may be considered a fair equivalent of the formal preliminary requirements made in the case of regular students.

No one should present himself for admission as a special student until he has first received from the Dean assurance that his application has been favorably acted upon.

ADMISSION TO ADVANCED STANDING

Admission to advanced standing is upon examination. Persons who have the necessary qualifications for admission to the Department, and who have satisfactorily completed work in an approved Law School, may, upon presentation of a certificate of scholarship and of honorable dismissal from such school, become candidates for advanced standing in the Department to the extent of the work so completed. The certificate should show the nature of the work, the time it was pursued, the text books used and the grade received. Under similar conditions attorneys at law in good and regular standing from any state in which an adequate examination for admission to the bar is required, may apply for one year's advanced standing in the Department.

All candidates for advanced standing should secure the above mentioned certificates of preparatory work and of legal study and send them to the Dean of the Department before presenting themselves for admission. He will then inform them whether they may receive advanced credit and the time that will probably be required to complete the course.

In the fall of 1914 examinations for admission to advanced standing will be held from September 24 to 29. All candidates are expected to present themselves at this time.

The summer session of the Department offers advantages to applicants for advanced standing, which are explained in the chapter on the Summer Session.

COMBINED COURSES IN COLLEGIATE AND LAW STUDIES

The marked tendency of the day is toward an increasing thorough equipment for every profession. In no profession has the standard of proficiency more rapidly advanced than in the law. Accordingly every student expecting to enter this Department is urged to take as thorough and complete a collegiate course as his circumstances will permit. All who can do so are, therefore, urged

to consider the combined course in collegiate and law studies more fully described on page 126. It is the aim of this course to provide a broad collegiate training with a thorough technical preparation for the practice of law.

SIX-YEAR COMBINED COURSE

By taking the combined course in collegiate and law studies it is now possible for students who receive permission to shorten from seven to six years the time required to earn the degrees of Bachelor of Arts and Bachelor of Laws. The work of students who receive permission to enter upon the combined course is under the supervision of the joint special committee consisting for the current year of Professors EFFINGER, BATES, CANFIELD, GODDARD, and HALL.

A fuller description of the combined course may be found on pages 126 and 127, where may be found, also, for those who cannot take the full six-year course, a suggested two-year course preliminary to the study of law.

CLASS RATING

It is expected that students will, at the time of their admission to the Department apply for and obtain such class rating as they may desire and be entitled to, and that such rating will be final. But in case of subsequent unexpected change in circumstances or condition, application may be made to the Dean, at the beginning of a semester only, for a change in classification of work.

Students who, because of deficiencies in entrance requirements, have been admitted as special students, may at the beginning of the second year present to the Dean the necessary evidence of having made up such deficiencies, and apply for a change from special to regular standing. After the beginning of the second year no special student may offer for entrance credits earned while he was enrolled as a student of law, or may secure a regular standing by making up entrance deficiencies, nor will any students be permitted by enrollment as a special student to shorten the full three years of law study required to secure a degree. If the change requested contemplates advanced standing, the student must comply with the requirements for advanced standing as hereinbefore set forth.

COURSES OF INSTRUCTION

To secure a degree the student must complete seventy-two hours of work. Of this twenty-four hours is elective, and forty-eight hours, including all the work of the first year, is prescribed. Without special permission from the

Faculty not more than thirteen hours can be elected in any one semester.

The course of instruction is a graded one, and extends through three years of nine months each. The student, by entering upon his course in July, may complete the full course in three summer sessions and two full years. The course offered in the Summer Session is described in a later chapter.

The following is a statement of the work offered in the Department. At the opening of each semester a schedule showing the hours of recitations and the text and case books used in the various courses is published and distributed.

FIRST YEAR

FIRST SEMESTER

Contracts.—Formation of a contract, including public policy. Text-book and cases. Three hours a week. Professor KNOWLTON.

Criminal Law and Procedure.—Cases. Three hours a week. Assistant Professor BARBOUR.

Property I.—The law of personal property; also in the law of real property; the topics of tenure, estates, seisin, statute of uses, fixtures, emblements, and waste. Cases. Three hours a week. Professor DRAKE.

Torts.—Text-book and cases. Four hours a week. Professor WILGUS.

SECOND SEMESTER

Agency.—Text-book and cases. Two hours a week. Professor GODDARD.

Common Law Pleading.—Text-book and cases. Three hours a week. Professor BOGLE.

Contracts.—Operation, interpretation and discharge of contracts. Text-book and cases. Three hours a week. Professor KNOWLTON.

Property II.—Natural rights, profits, easements, covenants running with the land at law, equitable restrictions, public rights, and rents. Cases. Three hours a week. Professor AIGLER.

SECOND YEAR

FIRST SEMESTER

Equity Jurisprudence.—The origin, development, maxims, principles and doctrines of equity. Text-book and cases. Four hours a week. Professor BOGLE.

Property III.—Acquisition of real estate *inter vivos* including the topics adverse possession, prescription, form of conveyances, description of property conveyed, estates created, creation of easements and profits, covenants for title, estoppel by deed, execution of deeds, and dedication. Cases. Four hours a week. Professor AIGLER.

Electives.—Four or five hours.

SECOND SEMESTER

Conveyancing.—The purpose and scope of the work are explained on page 376. Class divided into groups by states for the practical work. Text-book and practical work. Three hours a week. Professor ROOD and assistants.

Evidence.—Cases. Four hours a week. Professor LANE.

Electives.—Five or six hours.

THIRD YEAR

FIRST SEMESTER

Conflict of Laws.—A study of the law that governs in transactions between parties in different states, or in foreign countries, where the laws of the different states, or countries, as to the matter involved are different. Text-book and cases. Two hours a week. Professor LANE.

Practice Court.—The purpose and nature of the work are explained on page 374. Class divided into groups of four. One hour course. Professors SUNDERLAND, STONER, WAITE, and DUFFEE.

Trial Practice.—Written answers and discussions of selected questions on the principles of practice and procedure, each student preparing his answers according to the rules of his own state. Two-hour course. Professor SUNDERLAND.

Electives.—Seven or eight hours.

SECOND SEMESTER

Constitutional Law.—Cases and text-book. Three hours a week. Professor BATES.

Practice Court.—The work is described on page 374. Class divided into groups of four. One-hour course. Professors SUNDERLAND, STONER, WAITE, and DUFFEE.

Electives.—Eight or nine hours.

ELECTIVES

In addition to the above courses, covering 48 hours of work which are required of all students, each candidate for a degree is required to elect from the following not less than 24 hours of work.

Bailments and Carriers.—Brief consideration of bailments in general, and particular attention to the law of pledge, innkeepers and common carriers of goods; carriers of passengers; the Post Office, and telegraph and telephone companies, as carriers of messages. Text-book and cases. Two hours a week. Professor GODDARD.

Bankruptcy and Insolvency.—Assignments at the common law; procedure under the Bankruptcy Act. Cases. Two hours a week. Professor HOLBROOK.

Bills of Exchange and Promissory Notes.—Includes a careful study of the Negotiable Instruments Law as enacted in many of the states. Text-book and cases. Two hours a week. Professor BUNKER.

Code Pleading.—Text-book and cases. Two hours a week. Professor SUNDERLAND.

Corporations, Private.—Cases. Four hours a week. Professor WILGUS.

Damages.—Cases. Two hours a week. Professor DRAKE.

Domestic Relations.—Husband and wife, parent and child, guardian and ward, master and servant. Two hours a week. Professor HOLBROOK.

Equitable Remedies.—Including injunction, specific performance, and receivers. Text-book and cases. Three hours a week. Professor BUNKER.

Equity Pleading and Procedure.—Cases. Two hours a week. Professor BUNKER.

Federal Courts.—The system of courts created under the authority of the Constitution of the United States, the jurisdiction of the several courts and the procedure therein. Text-book. Two hours a week. Professor BUNKER.

Insurance Law.—History, nature, and general principles of insurance law; fire, life, accident, and marine insurance. Text-book. Two hours a week. Professor LANE.

Judgments.—Attachments, garnishments, judgments and executions. Text-book and cases. Two hours a week. Professor ROOD.

Jurisprudence, Science of.—The object of this course is to give students, after their study of the various branches of the law in isolation, a systematic and comprehensive study of the few underlying principles of all law, taking Holland's "Elements of Jurisprudence" as the basis of lectures and recitations. Definitions of jurisprudence, law, right, etc.; leading classifications of law and rights; the relations of private, public, and international law. Two hours a week. Professor DRAKE.

Mining Law and Irrigation Law.—The discovery and location of lode and placer claims under the mining laws; assessment work; extra-lateral rights; adverse claims; mining claims and other public-land rights; mining partnerships. Cases. Three hours a week. Professor HOLBROOK.

Mortgages.—Cases. Two hours a week. Professor DUFFEE.

Municipal Corporations.—Creation and control of public corporations; constitutional limitations concerning the same; powers, including police powers, control of streets and highways, taxation and assessments, eminent domain, corporate powers; municipal securities, charters, ordinances, liabilities and duties. Text-book and cases. Two hours a week. Professor STONER.

Partnership.—Text-book and cases. Two hours a week. Professor DRAKE.

Patent Law.—Cases. Two hours a week. Professor WAITE.

Property IV.—Conditions, reversions and remainders, rule in Shelley's case, future uses, executory devises and bequests, powers, rule against perpetuities, and restraints on alienations. Cases. Three hours a week. Professor ROOD.

Public Officers and Extraordinary Legal Remedies.—These subjects are treated in one course, as cognate to and supplementary of each other, the case selected at the same time developing the law of extraordinary legal remedies and illustrating the law of public officers. Nature of office; eligibility; appointment and election; acceptance; qualifying; officers *de facto*; validity of contracts concerning offices and officers; resignation; removal; acceptance of incompatible office; rights, duties and liabilities of officers. Mandamus; quo warranto; prohibition; certiorari; procedendo; habeas corpus. Cases. Two hours a week. Professor STONER.

Public Service Companies.—A study of the general principles covering public carriers, public work and other public utilities, but not including the law of common carriers in so far as it has been treated in the course in Bailments and Carriers. Cases. Two hours a week. Professor GODDARD.

Quasi-Contracts.—Obligations imposed by law, enforceable through contractual remedies. Cases. Two hours a week. Professor DUFFEE.

Roman Law.—A sketch of the history of the Civil Law, together with an outline of the fundamental principles of the Justinian Code. Sohm's Institutes of Roman Law. Two hours a week. Professor DRAKE.

Sales and Personal Property.—Sale and contract to sell; Statute of Frauds; conditions and warranties, and remedies for breach thereof; delivery; acceptance and receipt; seller's lien; stoppage *in transitu*; bills of lading and *jus disponendi*; factor's acts. Text-book and cases. Three hours a week. Professor WAITE.

Suretyship.—Lectures and cases. Two hours a week. Professor BUNKER.

Taxation.—The nature and purpose of taxes; the taxing power and its limitations; systems and subjects of taxation; the collection of taxes and remedies applicable thereto. Cases. Two hours a week. Professor WAITE. (Given in alternate years. Omitted in 1913-1914.)

Wills and Administration.—Gifts *causa mortis*; descent and distribution, testamentary capacity; execution; revocation and revival of wills; construction of wills; ademption and lapse of legacies; executors and administrators; payment of legacies; distribution of estate. Cases. Three hours a week. Professor BATES.

SPECIAL COURSES

The following courses of special lectures, given at intervals during the year, are open to members of the second and third year classes:

Admiralty Law.—Mr. CANFIELD.

Copyright Law.—Mr. REED.

Legal Ethics.—Mr. MAXWELL.

Medical Jurisprudence.—Dr. VAUGHAN and Mr. LIGHTNER.

Michigan Statute Law.—Mr. BOUDEMAN.

Patent Law.—Mr. WALKER.

Roman Law, Advanced Course.—Professor DRAKE.

Statute Law.—Mr. BOUDEMAN.

Trade-mark Law.—Mr. ROGERS.

FOURTH YEAR COURSE

The degree of Master of Laws is conferred upon persons holding the degree of LL.B., granted by this University or by any approved Law School, provided that the applicant has maintained a high standard of scholarship in the law school from which he obtained his degree, and has completed a fourth year of law study as prescribed by the Faculty.

Graduates of the Department of Law of the University of Michigan will be admitted as candidates for the degree of LL.M. only upon obtaining permission of the Dean. Those who have received their degrees from other law schools must present certificates from such schools showing in detail the courses taken and the scholarship grades obtained in each course, and must, in addition, present a statement from the Dean, or other officer of such school, to the effect that the applicant is qualified to pursue further work in law and is recommended therefor. This may be in a separate communication, or in the certificate above referred to. It is proposed to admit to the course only those students whose records indicate that they are above mediocrity and will derive genuine benefit from further law work.

Candidates for the degree of LL.M. shall take not less than ten nor more than twelve hours of work each semester. This work shall be elected:

(a) from courses given in this Department for which the candidate has not already received credit, if he be a graduate of this Department, and of which he has not had the equivalent, if he be a

graduate of any other law school. All candidates for this degree shall be required to take the courses in Roman Law and in the Science of Jurisprudence, provided they have not received credit for said courses or their equivalents. And,

(b) from courses offered by the Department of Literature, Science, and the Arts directly connected with or collateral to some phase of the law. Such courses as the two in Public International Law (6 hours), Constitutional History of the United States (6 hours), Constitutional History of England (6 hours), and certain courses in Political Economy are of the types preferred.

At least fifty per cent of the work must be elected from courses given in this Department, provided, however, that in special cases permission of the Faculty may be granted to vary from this requirement.

EXAMINATIONS

It is the purpose of the Faculty that the work of the Department shall be characterized by its completeness and thoroughness. The aim is to fit students for the practice of law in any part of the country. As one means of accomplishing the desired result, the examinations are made comprehensive and searching. The university year is divided into two terms, called semesters. At the end of each, two weeks are set apart for the thorough examination of all students upon the work of the semester. The examinations are in writing, and are final as to the work of the semester. The promotion of a student to full standing in his class at a subsequent semester, and his continuance in the Department, are dependent upon the manner in which he passes such examinations. Furthermore, the Faculty does not hesitate to drop a student from the rolls at any time during the year, when satisfied that he is neglecting his work and not conforming to the requirements of the Department.

Special examination for students conditioned or absent from the regular examinations, are held in September of each year during the week before the opening of the Department, and also for third year students at the end of the week following the spring recess. No examinations will be given except at the dates mentioned above.

THE PRACTICE COURT

It has been an objection frequently urged against the completeness of the training given in law schools that the student acquires no knowledge of actual practice. This objection has been largely removed by the introduction of the practice court. The practice court is a part of the Department, and is presided over by the professor of practice; who gives his entire time to this work, while other members of the Faculty co-operate in conducting it. Its work is divided into three parts, that of the law term, that of the jury

term, and that of appellate jurisdiction. The court is provided with a full corps of officers, including the members of the Faculty, who may sit from time to time as presiding judge, the full bench of judges sitting as a supreme court, a clerk, a sheriff, and the necessary deputies. Ample and commodious rooms have been provided for the use of the court, including a large court room fitted up with all the furniture and fittings necessary for the trial of jury cases, jury rooms, and clerk's office. The latter is provided with all the books and records used in actual practice, and a full supply of the blanks in common use in the several states.

The purpose of the court is to afford to the student practical instruction in pleading and practice both at law and in equity, under the common law system and the "code" or "reformed" procedure, and actual experience in the commencement and trial of cases through all their stages. In commencing the actions, the students assigned to the case are permitted to select the state in which the action is supposed to be brought, thus enabling the student to acquire the practice as prevailing in his own state. All questions of practice, pleading, and procedure are governed by the law of the state in which the action is so laid, but questions of substantive law are determined according to the weight of authority.

Two classes of cases are presented:

First. Cases arising upon given statements of fact, prepared and assigned by the professor of practice, upon which process is to be issued, pleadings framed, and the case conducted to an issue, when it is argued and disposed of as a question of law upon the facts submitted. This class of cases affords the student practical experience in the commencement of suits, the preparation of pleadings, and the argument of the questions of law arising from the facts. The practice and pleadings are under the common law or the code procedure as the students may elect. There are two public hearings in this course: *a.* The questions arising upon the pleadings are argued and disposed of at a regular session of the court presided over by the professor of practice. *b.* After the pleadings have been approved, the case is set down for a separate hearing upon the question of law. This argument is heard either by the professor of practice or by that member of the Faculty who has charge of the instruction in the subject involved. When the issues so arising have been satisfactorily disposed of, the student is given credit for the first course.

Second. Actual controversies are arranged and assigned for trial as issues of fact. The course includes the entire conduct of an actual case from its beginning to a final judgment in the supreme court. This involves the issue of a proper process, the preparation and filing of appropriate pleadings, the subpoenaing of the witnesses, the impaneling of a jury, the examination and cross-examination of witnesses, the arguments to the court and jury, and all the other incidents of a contested trial.

For the purpose of this work the class is divided into sections, and the work of attorneys, witnesses, jurors, and the like is performed by the students. A member of the Faculty presides at these trials, and they are conducted with all the dignity and decorum of actual practice. Upon the satisfactory completion of the course, credit is given for it.

Every member of the third-year class who is a candidate for a degree is expected to take part in both courses, and to perform all the incidental duties which may be required of him. Satisfactory completion of both courses is a condition precedent to graduation.

The practice court supercedes the moot courts formerly conducted in the Department.

CONVEYANCING

In order further to extend the practical instruction given in this Department, a course in conveyancing is provided. It is the purpose of this course to give by text-books and lectures a full and systematic instruction in the substantive law of conveyancing, and also a thorough drill in the actual preparation of all the more important forms of conveyances, including thereunder not only deeds, mortgages, wills, and assignments of various sorts, but also such contracts, agreements, corporate and partnership articles, and other instruments, as the lawyer in actual practice is likely to be called upon to prepare. To accomplish this purpose, the class is furnished with statements of fact and with a requisition for the appropriate conveyance, and each student is required to prepare, under the direction of the professor in charge of this course, the various forms of instruments in question, and to submit them for examination and criticism. If not in proper form they must be rewritten or corrected. Neatness, accuracy, and a lawyer-like method of expression are insisted upon. The correctness of the body of the instrument is not alone attended to, but the variations of forms in the execution and acknowledgement where one of the parties is a corporation, a partnership, a married woman, and the like, receive attention.

The work of this course must be satisfactorily completed by each member of the third-year class.

ORATORY

It is important that those who study law with a view to becoming advocates should give attention to the subject of public speaking. It is a mistake to suppose that excellence in speaking is simply a gift of nature, and not the result of patient and persistent labor and study.

Information regarding the University Oratorical Association, the Northern Oratorical League, the Central Debating League, the testimonials, and the annual contests in oratory and debate, which afford opportunity for a practical application of the principles taught, may be found on pages 74 to 77.

The following courses, given by Professor TRUEBLOOD and Assistant Professor HOLLISTER, are optional; but when a student has elected a course he is required to complete it. Failure to do so will affect his standing at graduation.

FIRST-YEAR CLASS

FIRST SEMESTER

1. *Elocution.* Exercises in vocal culture, breathing, position, and gesture; pronunciation and emphasis; elements of quality and force of voice, with their application to choice passages from the orators. Two sections. Two hours a week.

SECOND SEMESTER

2. *Public Speaking.* A study of the principles that underlie good public speaking, with the preparation and delivery of short original speeches. Two sections. Two hours.

SECOND-YEAR CLASS

FIRST SEMESTER

3. *Debating.* Study and application of the principles of argumentation. Preparation of briefs. Leading questions of the day debated in class. The aim is to develop readiness in extempore speaking, to give freedom and ease on the platform, and to cultivate the logical processes of analysis and discrimination. All who expect to enter the debating contests should take this course. Two hours a week.

SECOND SEMESTER

4. *Debating.* Continuation of Course 3. Two hours a week.

DEGREES

Degree of Bachelor of Laws (LL.B.)

The degree of Bachelor of Laws is conferred upon those students in the Department who have met the entrance requirements for candidates for the degree, as stated on page 365, and who have satisfactorily completed the three years course, in accordance with the regulations established by the faculty. For those who come without advanced standing in law, this means regular attendance throughout three University years, or the equivalent in University years and summer sessions. For this purpose, three summer sessions may be considered as the equivalent of one University year. This period of attendance may be proportionately reduced for students who enter upon advanced standing. In no case, however, will this

degree be conferred upon any student who has not been in attendance for at least the entire senior year of the course.

Degree of Master of Laws (LL.M.)

The degree of Master of Laws will be conferred upon those students who hold the degree of Bachelor of Laws from an approved institution, and who have completed in this Department a fourth year of work as prescribed by the faculty, and explained on page 373.

Degree of Doctor of Law (J.D.)

The degree of Doctor of Law is conferred upon students who have obtained the degree of Bachelor of Arts, or a substantially equivalent degree, either in the Department of Literature, Science, and the Arts, of this University, or in some other approved college or university, and who have pursued the study of Law in this Department for three University years, or in any approved law school for one year and in this Department for at least two years, and who have maintained an exceptionally high standard of scholarship in at least three-fourths of their law work, computed on the basis of hours of credit. Credits obtained in summer sessions will count toward the degree.

GRADUATION

Only those who are present in person may receive their diplomas on Commencement Day. Others who have satisfied all the requirements for graduation, including the payment of the graduation fee, will receive their degrees at a subsequent meeting of the Board of Regents.

No student will be recommended for a degree until after the graduation fee of ten dollars has been paid to the Treasurer of the University. In case of graduation in June this fee must be paid at least twenty-five days prior to Commencement Day. Blanks for this purpose must be obtained from the Secretary of the Department.

CERTIFICATES OF ATTENDANCE

A person who has been connected with the school for a period not entitling him to graduate may, on application to the Secretary of the Department, receive an official certificate of attendance, which states the time of his attendance and the degree of his attainment.

LIBRARY

The Law Library now contains about thirty-two thousand volumes, including all the published reports of the courts of last resort of every state in the Union and those of most of the intermediate appellate courts, the Federal Courts, and the English, Scotch, Irish and British Colonial Reports. Duplicate, and in some cases triplicate sets of several of these reports have been added. There is also an extensive collection of treatises and textbooks, both English and American. Nearly complete sets of statutes and session laws of the United States, Great Britain and her colonies, and practically all of the American and English legal periodicals are in the Library.

The Library has been enriched by a number of gifts from friends of the University, including the Honorable Richard Fletcher, formerly one of the Justices of the Supreme Court of Massachusetts, the late Honorable Christian H. Buhl, of Detroit, the Honorable Samuel T. Douglass, formerly one of the Justices of the Supreme Court of Michigan, the heirs of the Honorable Thomas M. Cooley, and those of the late O. H. Dean, of Kansas City.

The General Library of the University, which contains more than two hundred thousand volumes, is also open to use by students in the Department of Law. It is rich in works of interest and importance to the lawyer.

LITERARY SOCIETIES

There are two flourishing literary societies—the Webster and the Jeffersonian—established and conducted by the students of law for the purpose of literary culture.

MICHIGAN LAW REVIEW

THE MICHIGAN LAW REVIEW is a legal periodical conducted under the auspices of the Department of Law. It is edited by a member of the Law Faculty, assisted by a Faculty Advisory Board, but all members of the Faculty co-operate in conducting it. Students selected from the Third Year Class, act as editorial assistants.

The purpose is to give expression to the legal scholarship of the University, and to serve the profession and the public by timely discussion of legal problems, and by calling attention to the most important developments in the field of jurisprudence.

The REVIEW is made up of four chief departments: First, leading articles upon important and interesting legal subjects; second, notes and comments upon current topics and significant occurrences in the legal world; third, abstracts and digests of the most important recent cases; and fourth, reviews of books and comments on legal literature.

It is the aim to make the REVIEW practical without usurping the functions of the text-book or the digest, and scholarly without being so academic in character as to be out of touch with the needs and aims of the lawyer of today. It contains about eighty pages in each issue, and regularly appears on the first of each month during the academic year. The enterprise is in no sense conducted for the pecuniary benefit of those engaged in it, or any of them. All profits which may accrue, are devoted to the improvement of the magazine, and the promotion of the welfare of the Department of Law.

RULES GOVERNING PARTICIPATION IN PUBLIC ACTIVITIES

For the rules governing participation in public activities see page 83.

FEES AND EXPENSES

The matriculation Fee and the Annual Fee must be paid in advance, and no student can enter upon his work until after such payment. For the rules governing Second Semester fees and the re-funding of fees see page 95.

Matriculation Fee.—For Michigan students, *ten dollars*; for all others, *twenty-five dollars*.

Annual Fee.—For Michigan students, *sixty-two dollars*; for all others, *seventy-two dollars*.

Graduation Fee.—For all alike, *ten dollars*.

For additional information in regard to expenses, see page 93.

School of Pharmacy

A special announcement giving further information in regard to this school is published annually. For copies of this Announcement, or for other information relating to the school, address The School of Pharmacy, Ann Arbor, Michigan.

The School of Pharmacy gives training for all branches of pharmacy and for various chemical pursuits. It provides a well-grounded preparation for services as a manufacturing chemist, or as an analyst. The graduate is assured a thorough qualification for the prescription table and for the most responsible positions in pharmacy. He is fitted to act as the chemist of the medical profession. He is in a position to meet the wants of manufacturers of foods and drugs, who guarantee quality and strength of their products as demanded by the Food and Drugs Act, which became operative January 1, 1907. In respect to the discipline of both the intellectual and the executive powers, the work of the school offers decided advantages, in the steady requirement of severe studies, and of exact operations on the part of each student.

The school year extends from the Tuesday preceding the first Thursday in October to the last Thursday in June (September 29, 1914, to June 24, 1915). Students of the first year are released the second Friday before Commencement.

For the full regular work, admission cannot be granted at any other time than at the opening of the first or the second semester (February 8, 1915), as students are instructed in classes in progressive order. For investigation, or special studies, students can be received at any

time when there is room in the laboratories. Many of the subjects taught in the School can also be taken in the Summer Session of the University (see a subsequent chapter).

REQUIREMENTS FOR ADMISSION

Applicants for admission as undergraduates must be at least sixteen years of age, and must have completed the requirements for admission as here described. These requirements are stated in units, a unit meaning the equivalent of five recitations a week in one branch of study for one year, amounting in the aggregate to not less than one hundred twenty sixty-minute hours in the clear. Two to three hours laboratory, drawing, or shop-work will be counted as equivalent to one of recitation.

(A) Fifteen units are required for admission. These fifteen units must include three units of English Composition and Literature, two units of a Foreign Language, one unit of Algebra and one of Geometry, and one unit of Physics, and may include not more than three units from Group II. They must embrace two subjects of three units each from Group I. It is, however, strongly recommended that one or more studies be pursued throughout the four years of the high school course.

The subjects from which choice may be made, and the number of units which will be accepted in each subject, are as follows:

Group I

English Composition and Literature, 4 or 3 units.	Geometry, $1\frac{1}{2}$ units, or 1 unit.
Greek, 3 or 2 units.	Trigonometry, $\frac{1}{2}$ unit.
Latin, 4, 3, or 2 units.	Chemistry, 1 unit.
French, 4, 3, or 2 units.	Botany, 1 or $\frac{1}{2}$ unit.
German, 4, 3, or 2 units.	Zoology, 1 or $\frac{1}{2}$ unit.
Spanish, 4, 3, or 2 units.	Physiology, $\frac{1}{2}$ unit.
History, 3 or 2 units, or 1 unit.	Geology, $\frac{1}{2}$ unit.
Algebra, 2 or $1\frac{1}{2}$ units, or 1 unit.	Physiography, 1 or $\frac{1}{2}$ unit.

Three units of science may be offered as a three-unit subject.

In order that a half unit in science may be accepted it must be supplemented by a second half unit in science. For this purpose the following groupings are suggested: (a) Botany and Zoology; (b) Zoology (or Botany) and Physiology; (c) Physiography and Geology; (d) Physiography and Botany.

Two units of Mathematics and one unit of Physics may be offered as a three-unit subject, in which case a second unit of science must be presented.

Group II

Agriculture, 2 units or 1 unit.

Domestic Science, 2 units or 1 unit.

Drawing, 1 or $\frac{1}{2}$ unit.

Manual Training, 2 units or 1 unit.

Commercial Branches, 2 units or 1 unit.

Subjects from Group II will not be accepted for admission on examination.

(B) Graduates of schools on the approved list of the North Central Association of Colleges and Secondary Schools will be admitted upon the presentation of an unqualified recommendation covering not less than fifteen units, of which at least twelve must be from Group I. Admission on this basis of recommendation may be granted also to the graduates of other especially approved high schools. Applications for this privilege must be made by the superintendent or principal on special blanks which may be obtained from the Dean.

Credentials, in order to be recognized, must be sent by the superintendent or principal directly to the Dean. This may be done at any time of the year upon the appropriate blank furnished by the Dean.

From Colleges.—Students who have completed at least one year's work in an approved college of literature and science, and who bring explicit and official certificates describing their course of study and scholarship, and testifying to their good character, are admitted without examination.

ADMISSION TO ADVANCED STANDING

Students who have gained admission to the school may apply for credit in any of the college studies which they have pursued in another college, or in a high school whose graduates are admitted. Such application should be made to the Dean at the time of entering the School, and may be referred to the professor in charge of the studies in which credit is asked. Applicants are required to bring explicit credentials as to the work done. *Credits from other Schools of Pharmacy are adjusted separately for each study. Owing to difference in the order and extent of the studies, credits cannot be counted in years of pharmaceutical college study.* Applicants by correspondence before the opening of college, may have their credentials acted upon for advanced standing. One year's residence in this University is required before graduation.

Credits are received from the other Departments, and from the Summer Session, of this University.

**ADMISSION OF STUDENTS NOT CANDIDATES
FOR A DEGREE**

Persons over nineteen years of age who bring evidence of having been engaged in the practice of pharmacy for at least two years, may be admitted to pursue selected studies upon passing an examination in writing, spelling, use of capitals, and grammatical construction. The same privilege is accorded to persons over twenty-one years of age who have not had practical experience and who are able to study with advantage in the School, the same examination being required as to the correctness of English writing.

Students admitted under the above provisions are not, however, regarded as candidates for a degree, and they do not become eligible for graduation until they have passed all the examinations for admission to the course leading to the degree which they seek to obtain.

Students not candidates for a degree may elect such studies as they are prepared to pursue, under the regulations of the Faculty. Selected studies may be continued as long as, in the judgment of the Faculty, they are carried with success and profit.

APPLICANTS FOR ADMISSION

Applicants arriving in Ann Arbor will please call either at the office of the Dean or at the office of the Secretary in the new Chemistry and Pharmacy Building.

REGISTRATION AND ELECTION OF STUDIES

On or before the first Saturday of each semester, each student should determine upon his studies for that period, and register them in due form upon an "election blank" obtained from the Secretary of the Faculty.

In the two-year course the studies are mainly, though not wholly, the same for all students, and the order of succession is as given on page 390. When opportunity of choice is offered, the student should consult in advance with members of the Faculty.

If a student registered in the School of Pharmacy takes work in mathematics, physics, language, or other subjects in the Department of Literature, Science, and the Arts, he must also register such studies on an "election blank" of that Department, countersigned by the Dean or the Secretary of the School of Pharmacy, and filed in accordance with the rules of that Department.

The election blanks of all students must be presented in person to the Secretary of the School of Pharmacy before 6 P. M. of the first Wednesday after the opening of the first semester, and before 6 P. M. of the second Saturday preceding the opening of the second semester.

They may be presented after these dates only upon payment of \$1.00.

Elected studies cannot be dropped without the permission of the Dean. No credit is given for courses not properly elected.

RULES GOVERNING PARTICIPATION IN PUBLIC ACTIVITIES

For the rules governing participation in public activities see page 83.

COURSES OF INSTRUCTION

The courses of instruction comprise lectures, recitations, and laboratory work. The amount of work in each course is expressed in hours, an *hour* signifying one exercise a week during one semester. A lecture or recitation is usually one hour in length. A laboratory exercise occupies approximately three or four hours, being continued until the work assigned to one exercise, or a due proportion of work assigned to the course, has been completed. The satisfactory completion of one exercise a week during one semester, including a sufficient standing in the examination held at the end of the semester, entitles the student to *one hour of credit* toward graduation. It is expected that a lecture or a recitation with

the personal study necessary to maintain the student's standing in the subject, will take in all as much time as a laboratory course. Therefore an *hour of credit* is regarded as having the same value whether obtained in a course of lectures or in a course of laboratory exercises.

The amount of credit toward graduation is indicated by the expressions *two hours, three hours, etc.*

PHARMACY

1. Theoretical Pharmacy and Pharmaceutical Arithmetic. Lectures and recitations, *Four hours*. First Semester. Dr. HUBBARD and Mr. MORSE.
2. Commercial Pharmacy. Lectures and recitations, *T, Th, at 10. Two hours*. First semester. Professor STEVENS and non-resident lecturers.
3. Drug Assaying and Pharmacopœial Testing. (First nine weeks.) Lectures and recitations, *M, W, F, at 11*. Laboratory work, *M, T, W, Th, F, 1-5. Three hours*. Second semester. Professor STEVENS, and Mr. GLOVER.
4. Prescription Reading and Incompatibilities. Lectures and recitations, *M, W, F, at 10. Three hours*. First semester. Professor STEVENS.
5. Prescription Practice. Compounding of prescriptions as met with in general practice. *W, S, 8-12. One hour*. Second semester. Professor STEVENS and Mr. GLOVER.
6. Study of the United States Pharmacopœia and the National Formulary. Lectures and recitations, *M, T, Th, F, at 11. Four hours*. Second semester. Mr. GLOVER.
7. Pharmaceutical Technic and Manufacturing Pharmacy. *T, Th, at 9*. Laboratory work daily 1-5. *Seven hours*. Second semester. Professor STEVENS, Mr. GLOVER, and Mr. BERG.

CHEMISTRY

- A and A1. Inorganic Chemistry, Descriptive and Experimental. Lectures, *M, T, Th, F, at 8*. Laboratory, *T, Th, 1-5. Six hours*. First semester. Assistant Professor LICHTY and Mr. FERGUSON.
- 1 and 1a. Elementary Inorganic Chemistry. Experimental lectures and recitations, *M, W, F, at 11*. Laboratory work two periods per week. *Four hours*. Second semester. Professor BIGELOW, Dr. HARRIS, and assistants.
- 2 and 2a. Continuation of Courses 1 and 1a. *Four hours*. Second semester. Assistant Professor HALE, Dr. HARRIS, and assistants.

3. Qualitative Analysis. Lectures and recitations, *M, W, F*, at 11. Laboratory work, *M, T, W, Th, F*, 1 to 5. *Seven hours*. Second semester. Assistant Professor WILLARD and Mr. MCALPINE.
- 3a. Qualitative Analysis. *Four hours*. Laboratory and recitations. Assistant Professor WILLARD, Mr. COLE, Mr. MCALPINE, and Dr. LAIRD.
4. Pharmaceutical Chemistry. Lectures and recitations, *M* at 9 and *Th* at 11. *Two hours*. Second semester. Mr. GLOVER.
5. Quantitative Analysis. Lectures and recitations, *T, Th*, at 10. Laboratory work, *M, W, F*, 1 to 5. *Five hours*. First semester. Assistant Professor WILLARD.
- 5b. Quantitative Analysis. Lectures and recitations. *Four hours*. First semester. For two year pharmacy students only. Professor CAMPBELL and Dr. WILLARD.
7. Carbon Compounds. Lectures and recitations, *M, W, F*, at 9. *Three hours*. First semester. Professor GOMBERG.
Course 7 must be preceded by Course 3 or 3b in general chemistry and accompanied by laboratory work in Course 42 to the extent of two hours credit.
- 7a. Organic Chemistry. Continuation of Course 7. *Two hours*. Lectures and recitations. *W, F*, at 9. Second semester. Professor GOMBERG.
Course 7a must be preceded by Course 7 and accompanied by laboratory work in Course 42a to the extent of two hours of more credit.
8. Elementary Physical Chemistry. Lectures, *M, T, Th, F*, at 10. *Four hours*. Second semester. Professor BIGELOW.
11. Organic Chemistry. *Three hours*. Lectures and recitations. *T, W, Th*, at 8. Assistant Professor CONE.
Course 11 should, if possible, be preceded by Course 3a or 3b.
12. Chemistry of the Household. *Three hours*. Lectures and recitations. *M, W, F*, at 2. Dr. HUBBARD.
Course 12 must be preceded by Courses 2 and 2a.
13. Physical Chemical Measurements. *Three to eight hours*. Laboratory work. Either semester. Assistant Professor LIND.
The course must be preceded or accompanied by Courses 5 and 8.
42. Organic Preparations. Laboratory work in organic synthesis. *Two to five hours*. Hours arranged with instructor. Either first or second semester. Professor GOMBERG and Assistant Professor CONE.
Course 42 must be accompanied by Courses 7 or 11.
44. Organic Analysis, Alkaloids. Lectures and recitations, *T, Th*, at 10. Laboratory work, *T, Th*, 1-5, *S*, 8-12. *Four hours*. Second semester. Professor SCHLOTTERBECK, Dr. HUBBARD, and Mr. SEELEY.

- 44a. Analysis of Foods, Drugs, etc. Laboratory work with collateral reading, *M, T, W, Th, F*. *Five hours*. Either first or Second semester. Professor SCHLOTTERBECK, Dr. HUBBARD, and Mr. SEELEY.
- 44b. Analysis of Foods, Drugs, etc. Continuation of Course 44a. *Five hours*. Second semester. Professor SCHLOTTERBECK and Dr. HUBBARD.

BOTANY

5. Pharmaceutical Botany. Lecture, *M*, at 9. Laboratory work, *W*, 8-10. *Two hours*. First semester. Assistant Professor HUS.
- 10a. Microscopy of Foods, Drugs, Spices, etc. Lecture, *M*, at 8. Laboratory work, *T, W, Th, F*, 8-10. *Four hours*. Second semester. Dr. HUBBARD, Mr. LAWRENCE.
- 10b. Microscopy of Foods, Drugs, Spices, etc. Continuation of Course 6. *Four hours*. Dr. HUBBARD.

PHARMACOGNOSY

1. Study of Crude Drugs. Lectures, recitations and practical work, *M, T, W, Th, F*, at 9. *Five hours*. First semester. Mr. LAWRENCE.

PHARMACOLOGY

1. Materia Medica and Therapeutics. Lectures and recitations. *M, T, Th, F*, at 8. *Four hours*. Second semester. Mr. EMERSON.

PHYSICS

1. General Physics: Mechanics, Sound, and Heat. *Four hours*. First semester. Professor RANDALL.
For Course 1 a knowledge of plane trigonometry is indispensable.
2. General Physics: Magnetism, Electricity, and Light. Lectures. *Four hours*. Second semester. Professor RANDALL.
Course 2 must be preceded by Course 1 and by a course in general chemistry.

BUSINESS ADMINISTRATION

- 38P. Elements of Accounting and Business Methods. Lecture and recitation, *Th*, at 11. Laboratory practice two-hour period. *Two hours*. Second semester. Professor FRIDAY.

BACTERIOLOGY

2. Bacteriology. Lectures. *Five hours*. Second semester. Professor NOVY.
3. Bacteriology. Laboratory work. *Three hours*. Professor NOVY.

PHYSIOLOGICAL CHEMISTRY

8. Physiological Chemistry. Professor VAUGHAN. Lectures three times a week, during the first semester.
9. Physiological Analysis, including the Analysis of Urine. Laboratory work and lectures. *Four hours.* Professor NOVY.

MINERALOGY

1. Elements of Mineralogy: Lectures and practice. *Two hours.* Either first or second semester. Professor KRAUS.
Course 1 should be preceded by a course in general chemistry.
2. General Mineralogy: Lectures and practice. *Five hours.* Second semester. Professor KRAUS.
Course 2 should be preceded by Courses 2 and 3 in chemistry.

EXAMINATIONS

The examination upon each course of instruction is held at the end of each semester, in February and in June.

The result of an examination is reported by the Professor in charge, for each student enrolled, to the Faculty, in terms as follows:

a (excellent), *b* (good), *c* (satisfactory), *d* (deficient), *e* (not passed).

To receive credit in a course the grade reported must be above *d*. A student reported *e* (not passed) receives no credit for the course and must re-elect it at the first opportunity if the course is required for his graduation.

A student reported *d* (deficient) is required to do further work in the course; this may, at the option of the instructor, embrace any or all of the following requirements: the completion of set exercises or problems, attendance at designated classes and private study, or the completion of a satisfactory examination at one of the regular examination periods.

Absent.—With statement of the cause of absence; if the student has left the class, stating at what time; or stating if absent without excuse or explanation.

Experience in the business of pharmacy is not made a requirement for a degree.

SEQUENCE OF STUDIES

I. TWO YEAR COURSE

Leading to the Degree of Graduate in Pharmacy.

NOTE.—Information concerning the courses mentioned in this schedule may be found in the preceding pages.

First Year

FIRST SEMESTER			SECOND SEMESTER		
	Course Number	Hours Credit		Course Number	Hours Credit
Chemistry (Gen.) (A&A1)	(5)	6	Chemistry (Qual.) (3a)	(3a)	4
Botany (Pharm.)	(1)	2	Botany	(10)	4
Pharmacy	(1)	4	Chemistry (Pharm.)	(4)	2
Pharmacy	(2)	2	Accounting	(38P)	2
			Hygiene	(1)	3

Second Year

FIRST SEMESTER			SECOND SEMESTER		
	Course Number	Hours Credit		Course Number	Hours Credit
Pharmacognosy	(1)	5	Pharmacology	(1)	4
Chemistry (Organ.)	(11)	3	Pharmacy	(7)	7
Chemistry (Quant.)	(5P)	4	Pharmacy (Prescr.)	(5)	1
Pharmacy (Prescr.)	(4)	3	Pharmacy (U. S. P.)	(6)	4
			*Review Quizzes		1

*Review Quizzes

During the second semester review quizzes are conducted once a week throughout the semester. They are especially arranged for senior students, but are open to students of all classes.

Theoretical and Practical Pharmacy and Pharmaceutical Arithmetic is in charge of Dr. HUBBARD.

Inorganic Pharmacy and Chemistry, U. S. Pharmacopœia, and Prescriptions is in charge of Mr. GLOVER.

Pharmacognosy and Materia Medica is in charge of Mr. LAWRENCE.

II. THREE YEAR COURSE

Leading to the Degree of Pharmaceutical Chemist.

NOTE.—The italic letter which follows the name of a subject denotes the department in which it is offered. For information concerning any subject the student should consult the bulletin or announcement of the department indicated; *p* denotes School of Pharmacy; *a* Department of Literature, Science, and the Arts; *e* Department of Engineering; *m* Department of Medicine and Surgery.

First Year

FIRST SEMESTER			SECOND SEMESTER		
	Course Number	Hours Credit		Course Number	Hours Credit
Chemistry (Gen.) (A&A1)	(6)	6	Chemistry (Qual.)	(3)	7
Botany (Pharm.)	(5)	2	Botany, <i>p</i>	(10)	4
Pharmacy	(1)	4	Chemistry (Pharm.)	(4)	2
German, <i>a</i> or <i>e</i>	(1)	4	German, <i>a</i> or <i>e</i>	(2)	4

Second Year

FIRST SEMESTER			SECOND SEMESTER		
	Course Number	Hours Credit		Course Number	Hours Credit
Chemistry (Organ.)	(11)	3	Hygiene, <i>m</i>	(1)	3
Chemistry (Quant.)	(5)	5	Bacteriology, <i>m</i>	(2)	5
Chemistry (Organ.)	(42)	2	Chemistry, <i>p</i>	(44)	4
Rhetoric, <i>e</i>	(1&1a)	5	<i>*Elective</i>		4

Third Year

FIRST SEMESTER			SECOND SEMESTER		
	Course Number	Hours Credit		Course Number	Hours Credit
Pharmacognosy, <i>p</i>	(1)	5	Pharmacology, <i>p</i>	(1)	4
Pharmacy (prescr.), <i>p</i>	(4)	3	Pharmacy, <i>p</i>	(7)	7
Pharmacy, <i>p</i>	(3)	3	Pharmacy (prescr.), <i>p</i>	(5)	1
Mineralogy, <i>a</i>	(1)	2	Pharmacy (U.S.P.), <i>p</i>	(6)	4
<i>Elective</i>		3			

III. FOUR YEAR COURSE

Leading to the Degree of Bachelor of Science (Pharmacy).

NOTE.—The italic letter which follows the name of a subject denotes the Department in which it is offered. For information concerning any subject the student should consult the bulletin or announcement of the Department indicated; *p* denoting the School of Pharmacy; *a* Department of Literature, Science, and the Arts; *e* Department of Engineering; *m* Department of Medicine and Surgery.

First Year

FIRST SEMESTER			SECOND SEMESTER		
	Course Number	Hours Credit		Course Number	Hours Credit
Chemistry (Gen.), <i>p</i> (1&1a)	(4)	4	Chemistry (Gen.), <i>p</i> (2&2a)	(4)	4
Rhetoric, <i>e</i>	(1&1a)	5	Botany, <i>p</i>	(10)	4
Botany (Pharm.) <i>p</i>	(5)	2	Hygiene, <i>m</i>	(1)	3
Mathematics, <i>a</i>	(1)	4	Accounting, <i>a</i> & <i>p</i> (38P)	(2)	2
			Chemistry (Pharm.)	(4)	2

Second Year

FIRST SEMESTER			SECOND SEMESTER		
Course	Hours		Course	Hours	
Number	Credit		Number	Credit	
Chemistry (Qual.), <i>p</i> (3)	7		Chemistry (Quant.), <i>p</i> (5)	5	
Pharmacy, <i>p</i> (1)	4		<i>Electives</i>	2	
Physics, <i>a</i> or <i>e</i> (1)	4		Physics, <i>a</i> or <i>e</i> (2)	4	
			Chemistry, <i>p</i> (8)	4	

* Chemistry (10), four hours, and chemistry (42), two hours, may be taken in place of chemistry (11) and (42) the first semester.

Third Year

FIRST SEMESTER			SECOND SEMESTER		
Course	Hours		Course	Hours	
Number	Credit		Number	Credit	
Chemistry (Organ.), <i>p</i> (7)	3		Chemistry, <i>p</i> (44)	4	
Mineralogy, <i>p</i> (1)	2		German, <i>a</i> or <i>e</i> (2)	4	
Chemistry, <i>p</i> (42)	2		Bacteriology, <i>m</i> (2)	5	
German, <i>a</i> or <i>e</i> (2)	4		Chemistry, <i>p</i> (7a)	2	
<i>Elective</i>	2		Chemistry, <i>p</i> (42)	2	
Chemistry, <i>p</i> (13)	3				

Fourth Year

FIRST SEMESTER			SECOND SEMESTER		
Course	Hours		Course	Hours	
Number	Credit		Number	Credit	
Pharmacognosy, <i>p</i> (1)	5		Pharmacology, <i>p</i> (1)	4	
Pharmacy (prescr.), <i>p</i> (4)	3		Pharmacy (prescr.), <i>p</i> (5)	1	
*Bacteriology, <i>m</i> (3b)	3		Pharm. (U.S.P.), <i>p</i> (6)	4	
<i>Electives</i>	3		Pharmacy, <i>p</i> (7)	7	
Pharmacy, <i>p</i> (3)	3				
*Chem. (Foods, etc.) <i>p</i> (44a)	3				

Every candidate for the degree of B.S. (Pharmacy) must elect the subjects printed in Roman type and enough optional courses printed in italics in addition to make in all one hundred and twenty hours of credit. In arranging studies at the beginning of each semester students will please consult with Dr. HUBBARD, Room 252, Chemistry and Pharmacy Building.

GRADUATE COURSES

In Pharmacology, Bacteriology, and Physiological Chemistry.
—Graduates of the School are given opportunity to pursue advanced work in these studies. See page 272 for courses in Bacteriology and Physiological Chemistry, and page 272 for courses in Pharmacology, which are recommended to graduate students.

For the Degree of Master of Science and Doctor of Philosophy.

—Advanced courses of study are offered in the several branches taught in the School, suitable for graduates who wish to earn the degree of Master of Science, or Doctor of Philosophy as explained in the chapter on the Graduate Department.

FELLOWSHIPS AND SCHOLARSHIPS

The Prescott Memorial Scholarship.—Alumni and friends of the School of Pharmacy are providing a permanent memorial to the late Doctor Albert B. Prescott in the form of a fund from which loans are to be made to worthy students to assist them in meeting the expenses of securing a pharmaceutical education. The fund is already sufficiently large to be available for this purpose, several loans having been made during the past year. Full information concerning the conditions under which loans are made can be obtained by addressing the Dean of the School of Pharmacy.

BOTANICAL GARDEN

In the botanical garden, the principal orders of flowering plants are cultivated, together with the most important of the medicinal species. There are also experimental plantations, where drugs are grown for chemical and pharmacological investigation.

**LIBRARY, BOOKS OF REFERENCE, AND
TEXT-BOOKS**

The School has an extensive library, which is shelved with the Chemical Library of the University, in the new Chemistry and Pharmacy building. It contains complete sets of the journals, the original repositories of the sciences related to pharmacy, as well as the current periodicals of the profession, encyclopedias and hand-books of chemistry and pharmacy, and the latest works of value in study. These books are in constant use by students in connection with their laboratory work, and in preparing for their recitations. Files of current numbers of the journals of chemistry and of pharmacy are also kept in the reading-room.

Text-books can be obtained in the book stores in this university town at lower rates than those ordinarily prevailing in the general

trade of other cities. Of the following list of books, those printed in italics must be provided by each student; the others are optional:

General Chemistry, *Alexander Smith*, Bigelow's Synopsis, Qualitative Analysis, *Prescott and Johnson, Morgan*. Quantitative Analysis, *Olsen*, Pharmacy and Dispensing, *Stevens*, *U. S. Pharmacopoeia*, *National Formulary*. Incompatibles, *Ruddiman*. Arithmetic of Pharmacy, *Stevens*. Botany, *Bastian*. Pharmacognosy, *Culbreth*, *Kraemer*, National or U. S. Dispensatory. Organic Chemistry, *Perkins and Kipping*. Organic Analysis, *Allen*, *Prescott*, *Lyons*. Pharmacology, *Cushny*.

FEES AND EXPENSES

The matriculation Fee and the Annual Fee must be paid in advance, and no student can enter upon his work until after such payment. For the rules governing the refunding of fees and the fees for the second semester, see page 95.

Matriculation Fee.—For Michigan students, *ten dollars*; for all others, *twenty-five dollars*.

Annual Fee.—For Michigan students, *fifty-seven dollars*; for all others, *sixty-seven dollars*.

Graduation Fee.—For all alike, *ten dollars*.

Laboratory Expenses.—These vary with the prudence and economy of the student, the average amount being about one dollar and twenty cents a week.

For additional information in regard to fees and expenses, see page 93.

Homœopathic Medical College

A special Announcement giving further details in regard to this College is published annually. For copies of this Announcement, or for other information relating to the College, address, Dr. W. B. Hinsdale, Dean, Ann Arbor, Michigan.

The Homœopathic Medical College, established as a Department of the University in 1875, offers superior advantages to students, who are properly prepared, desiring to secure a thorough education in medicine and surgery, especially from a homœopathic standpoint. It has commodious buildings on the University campus in the immediate vicinity of its well equipped modern hospital, which is one of the finest structures connected with the University.

The college year extends from the Tuesday preceding the first Thursday in October to the last Thursday in June (September 29, 1914, to June 24, 1915).

REQUIREMENTS FOR ADMISSION

Every applicant for admission to the Homœopathic Medical College must be at least seventeen years of age, and must present to the Faculty satisfactory evidence of good moral character.

Women are admitted, as to all other Departments of the University, on the same conditions as men.

Matriculates in a regular, specified course in the Department of Literature, Science, and the Arts, graduates of literary colleges of good standing, and those presenting satisfactory evidence of having completed one year of university or college work in an institution approved by the Faculty of this College, or its equivalents, are admitted without examination. Heretofore, students have been admitted upon certificates from the Michigan State Board of Registration in Medicine, without special reference to academic study in advance of high schools, although they have been encouraged to study for two

degrees, one in the Department of Literature, Science, and the Arts, and the other in this College. Combined courses, arranged with special reference to securing these degrees are outlined upon another page. (See page 397.)

Entrance with Conditions.—According to the University system of keeping records, credits are counted by semester hours. A year's work comprises thirty hours. Therefore, to be admitted in full standing, one must have credits satisfying that requirement. If the student be deficient in hours, he may be admitted upon condition. Twelve months are allowed in which to make up the deficiency. This can be done (1) by taking studies in the Department of Literature, Science, and the Arts while pursuing medical study; (2) by studying in the Summer Session following his first regular year in medicine; (3) by attending Summer Session before registering in this Department. Since eight hours may be taken in the Summer Session, students may enter conditioned in that number of hours and remove the same in one or more of the ways just indicated.

Admission on Examination.—Applicants for matriculation who, for any reason, cannot furnish the required credentials may be admitted upon examination. Refer to "Admission on Examination," page 110, and "Admission to Advanced Standing," page 397.

Credits not earned in this University may come from any college or university, of like standing, and should include full work in each of the sciences, Biology, Chemistry, and Physics. A reading knowledge of German or French is very desirable. The following scheme will serve as a guide:

- I. Chemistry: General, Qualitative, and Organic. The first two must be and the third should be with thorough laboratory drill.
- II. College Physics.
- III. General Biology, including both Zoölogy and Botany.
- IV. Rhetoric and English Composition.
- V. German or French, preferably German.

In all laboratory courses, a well-kept note book is required.

While Chemistry, Physics and Biology are required and the languages recommended in the order given, students may, especially if already proficient in a part of the list, select some subjects not mentioned. It is advised that those who take the year of collegiate studies outside the University, communicate with the Dean of the Department of Literature, Science, and the Arts, who will be pleased to make suggestions that may be deserving of consideration. Blanks will be furnished upon application, to all who wish to submit for review and evaluation an outline of their preparatory studies.

Further Particulars.—For the purpose of having credits reviewed, for advice as to pre-medical courses, and for special consideration of individual, peculiar, or irregular cases, as soon as one seriously contemplates studying medicine in this college, he is advised to communicate with the Dean.

On arriving in Ann Arbor, students should apply at the office of the Dean or Registrar of this college. These offices will be open daily during the latter part of September, and some one who can give information will be in attendance. An inquiry addressed to either the Dean or Registrar of the Homœopathic Medical College of the University of Michigan will receive prompt and cordial attention.

ADMISSION TO ADVANCED STANDING

Persons who have studied medicine elsewhere may be admitted to advanced standing upon evidence of proficiency in the studies which have already been pursued by the class to which they seek admission.

COMBINED LITERARY AND MEDICAL COURSE

A.B. AND M.D.

Students desiring to obtain the degrees of Bachelor of Arts in the Department of Literature, Science, and the Arts, and of Doctor of Medicine in the Homœopathic Medical College, may, by enrolling on the Combined Literary and Medical Course shorten from eight years to seven the time required to earn the two degrees. This privilege is open only to students who throughout their course maintain a uniform record of good scholarship. The work is under the direction of a Committee of five members representing the Department of Literature, Science, and the Arts, and the Homœopathic Medical College. With the consent of the Committee in charge, a candidate for the degree of Bachelor of Arts, who has been a student in the Department of Literature, Science, and the Arts for at least one year, and has 90 or more hours to his credit, of which at least 30 hours have been earned in the Department of Literature, Science, and the Arts of this University, may enroll upon the combined course; that is, while continuing his registration in this Department he may also register in the Homœopathic Medical College, provided the work he has already completed includes a sufficient number of the courses enumerated below to enable him to complete within one year the specific requirements described in the following paragraphs.

Students desiring to enter upon the Combined Literary and Medical Course must, before May 15 of the year of residence preceding the double registration, file with the Registrar of the Department of Literature, Science, and the Arts a formal application made out upon a proper blank to be obtained from that office.

When the student so registered in the two Departments has completed the first year of the Course in Medicine, and not less than

90 hours in the Department of Literature, Science, and the Arts, he will be recommended for the degree of Bachelor of Arts, provided he has completed the requirements for graduation from the latter Department (See page 116) and provided his work has included the following courses:

Rhetoric, 6 hours, including Courses 1 and 2.

French and German, 16 hours of either one, and 8 hours of the other.

English, 6 hours.

Psychology, 6 hours.

Physics, 10 hours, including two hours of laboratory work.

Chemistry, general, qualitative, and organic, 12 hours for students presenting Chemistry for entrance, otherwise 16 hours.

Physical Chemistry, 4 hours.

Biology, 8 hours.

Zoölogy, 6 hours.

Total, 82 or 86 hours.

Suggested electives: Latin or Elementary Greek, 8 hours; History, or Political Economy, or Philosophy, 8 hours; Qualitative Analysis, 4 hours; Organic Chemistry, 5 hours.

B.S. (IN MED.) AND M.D.

Students who so desire, may obtain the degrees of Bachelor of Science in Medicine and Doctor of Medicine in six calendar years by complying with the requirements above set forth, except that they must complete the first and second years of the course in Medicine, and that the credit required from the Department of Literature, Science, and the Arts, instead of 90 hours, shall be 67 hours before they may enroll upon the combined course, and 75 hours before they receive the B.S. (in Med.) degree, and shall include the following courses:

Rhetoric, 6 hours, including Courses 1 and 2.

French or German, 16 hours.

Physics, 8 hours.

Chemistry, general, qualitative, and organic, 12 hours for students presenting Chemistry for entrance, otherwise 16 hours.

Biology, 8 hours.

Total 50 or 54 hours.

Electives are suggested from the courses before mentioned.

Students taking the six-year course will ordinarily need to attend the Department of Literature, Science, and the Arts two and one-half years and two Summer Sessions. If their scholarship is sufficiently high, they may apply for permission to elect a limited number of extra hours.

Students who entered the Department of Literature, Science, and the Arts in the fall of 1913, or before, and who enroll upon the combined course in the fall of 1915, or before, are required to complete 60 hours in that Department.

COURSES OF INSTRUCTION

DESCRIPTION OF COURSES

The university plan is to provide instruction in one Department that may count for credits in another Department, thereby avoiding the duplication of teachers and courses. Students studying six years receive much of their instruction in the Department of Literature, Science, and the Arts, as previously indicated. Four-year students also receive their instruction in Chemistry in that Department and their instruction in Medical Jurisprudence in the Department of Law. Much of the laboratory and preliminary scientific training is taken with the students in the Department of Medicine and Surgery. The subjects which are under the immediate charge of members of the faculty of the Homœopathic Medical College are here outlined.

Materia Medica and Therapeutics.—*Materia medica* is taught as a natural science. Three lectures are given weekly, based as far as possible on studies of the original provings, paying special attention to the genius of each drug, its characteristics, and its relationship to other drugs. The physiological action of drugs, as ordinarily understood, is duly considered.

Systematic instruction in the principles and philosophy of Homœopathy is a natural feature. The course is given to the whole body of students, beginners as well as the more advanced, in order to fix in their minds the underlying principles of the science of homœopathic practice.

A thorough laboratory course in drug proving is a special feature of this College. Students are required to do a certain amount of original work in drug pathogenesis under the supervision of the Director of the Pathogenic Laboratory.

The Principles of Medicine.—The principles of medicine are taught in a separate course setting forth the scientific explanation of disease and the principles upon which a system of cure must be constructed. Attention is given to historic medicine and the various systems that have been in vogue as a means of attempted cure. In the medical clinic the idea is never lost sight of that the function of the physician is to cure the sick, and that to accomplish this end accurate prescribing is of the highest importance.

Theory and Practice.—The instruction in theory and practice is didactic and clinical. The subject is divided into separate courses covering all the ground, both general and special, with which a physician in general practice must be familiar. In this connection a special course in diseases peculiar to childhood, and in the feeding of infants and invalids, is given. The aim is to make the student, by applying his knowledge of pathology, a good diagnostician, and

by his knowledge of *materia medica*, a good prescriber. In the clinics especial attention is given to dietetics and similar means of treatment.

Medical and Physical Diagnosis.—Diagnosis is taught as a separate branch. The subject occupies one hour a week throughout two entire years.

In addition to regular class-room work and recitations, the students are divided into sections and examine the patients in the hospital, under the direction of the instructor in charge. Diagnosis clinics, in which all diagnostic means are employed are held regularly.

Surgery.—The work in surgery follows the following outline:

1. A course of lectures to students in the second year upon minor surgery and bandaging.

2. A course upon the principles of surgery:

3. A complete course upon operative surgery, fractures, and dislocations.

4. An examination and diagnosis clinic is held twice a week for the senior and junior classes. All patients presenting themselves for surgical treatment are examined and a clinical diagnosis made, which is checked up by the subsequent operative and pathological findings.

5. Operations upon the cadaver; a sufficient number of subjects is provided by the authorities without expense to the class. Each candidate for graduation is required to demonstrate his knowledge of operative surgery in this practical manner.

Students are assigned cases to diagnose and to present to the class. Under proper direction they are required to make the necessary preparations for operations and to assist when assistance is necessary. Advanced students, under the immediate supervision of the surgeon or his assistant, treat patients upon whom operations have been made.

Gynecology.—Gynecology is taught in three courses:—

1. Minor gynecology, dealing with the methods of diagnosis, the use of instruments used in operations, and the technique of operations themselves.

2. Major gynecology, dealing with the graver aspects of the subjects such as adventitious growth, extensive injuries, methods of making gynecological examinations and the medical and operative treatment indicated.

3. Clinical instruction. The hospital furnishes a superabundance of cases in all kinds of diseases peculiar to women. Each week several major and many more minor operations are performed. The students in this clinic, the same as in general surgery, prepare patients for operations, assist at the operating table, give anæsthetics, and have the after-care of cases and do the necessary surgical dressings, under the direction of the professor himself or of his assistant.

Obstetrics.—Students are taught the physiology of gestation, the pathological conditions that may be encountered in that period and in the puerperium, the principles of cleanliness, the mechanics of parturition and the manipulation of instruments. In the sub-clinics they familiarize themselves with the various methods of practicing "touch," palpitation, obstetric auscultation, etc.

Cases in obstetrics are assigned to each senior for his especial delivery and personal attendance. The many patients that come to the hospital from various parts of the state are utilized to the best possible advantage.

Ophthalmology.—Regular lectures on this important specialty, amply illustrated from the abundance of clinical material at the disposal of the Faculty, are given in the fourth year. The eye clinic forms one of the most interesting features of the clinical work, and affords the class every facility for a thorough, practical study of all the diseases of the eye that come under the observation of the physician. Students have cases assigned them for dressing and treatment, and thus acquire practical skill and knowledge in diagnosis, and in the use of the various instruments. A special course is given in the correction of errors of refraction.

Otology, Rhinology, and Laryngology.—The basis of the instruction, as in other departments will be the material, that has always been sufficient, afforded by the in-and-out patient departments of the hospital. There are, at every clinic, from twenty to thirty patients awaiting medical, topical, or surgical treatments of diseases of the ear, nose, and throat. The students are required to make instrumental as well as other examinations, to make diagnosis and to indicate the lines of treatment under the supervision of the professor. Regular courses of lectures upon these subjects are given to third and fourth year students.

Mental and Nervous Diseases.—Professor DEWEY has been placed in charge of the department of diseases of the nervous system and holds the weekly clinic in that subject. He also, in connection with Dr. O. R. LONG, Superintendent of the Michigan State Asylum, gives a practical course upon the various phases of the mentally defective and the insane. There is an abundance of clinical material to demonstrate all the more frequent forms of nervous diseases as well as many of the rarer ones.

Diseases of Children.—A full course of instruction is given in this subject.

Dermatology.—The course in Dermatology consists of lectures, quizzes, and a weekly clinic which is well supplied with material. Photographic, lithographic, and stereopticon plates are used in the differential demonstrations.

The department is well equipped with the latest Roentgen Ray and other electrical appliances, and practical instruction is given in their general and special adaptability to the treatment of malignant diseases of the skin.

Genito-Urinary Diseases.—The instruction includes two distinct courses :

1. A quiz and demonstration course, with weekly recitations.
2. A clinic which is made up of the cases in the hospital requiring either medical or operative treatment. This clinic is quite distinct from any of the other surgical or medical departments, and is given by the professor who also teaches Dermatology, a subject many times involving genito-urinary problems.

Toxicology.—The class is given a practical knowledge of the different positions and their antidotes. Especial attention is given to the physiological action of drugs and chemicals. The relation existing between drug action in producing abnormal conditions and diseases as they arise from natural or idiopathic causes is constantly kept before the student. This is a new course and a very important one. It really includes very much more than the subject of poisons and antidotes. Whenever a medico-legal opinion is pertinent, it is presented. Illustrations of a practical nature are introduced and experiments on animals employed.

Pharmacy and Pharmacology.—These subjects are largely covered in the departments of *Materia Medica*, Toxicology, and in the pathogenetic laboratory. Special instruction is also given upon the origin, preparation and administration of remedies.

Drug Proving.—A practical laboratory in Pathogenetics has been instituted in the hospital, with a special director in charge. Volunteer students, accepted with reference to their physical merit, are put through severe tests under the constant observation of the Director. A diet-table is provided for the provers, free of cost to themselves, that entire control may be had over them while they are testing drugs. As a result of the work done in this laboratory the College has been able to publish a number of instructive, original reports.

Dietetics.—A course is given in which the problems of food in relation to health and disease are discussed. The feeding of invalids and infants is given special attention. In the clinics, whenever the question of the effects of diet, the preparation of foods and drinks, and their proper administration can be profitably considered, the most is made of the opportunity. There is in the hospital a diet kitchen, in charge of a scientific dietitian in which the special diet lists are prepared and from which they are served. The senior students in charge of cases, under proper supervision, are required to make out orders for the feeding of their patients and to observe the preparation of the food.

Electro-therapeutics.—This department receives the prominence that so important a branch of therapeutics deserves.

The aim is to teach theoretically and practically the subject of electricity as it will be employed in the office of the physician in general practice. The use of the X-ray is also included in this department.

The hospital is equipped with much new and special apparatus, which, beside being in constant service is used in a thorough course of instruction, with clinical applications, for the fourth year students.

Demonstration Courses in the Specialties.—Before graduation each student is required to do actual work in demonstrating his medical and surgical skill. By operating upon the cadaver and upon animals; by manipulation of manikins and models; by actual dressing of wounds, and bandaging; by thorough drill in the practical use of the ophthalmoscope, the laryngoscope, the test case, and in the fitting of glasses; by the use of the microscope, and the spectroscope; by the making of tinctures and dilutions; by bedside demonstrations and examinations; by actual prescribing; by these methods the students become practical and are prepared to make successful physicians. The classes are divided into sections, and each individual has his share of actual work. For these demonstration courses there is no extra expense. Students assist at operations and take turns in ward visiting. They are also required to take, and arrange in writing the histories and to keep the records of patients that are assigned to them in rotation.

These histories are read in the classes, reviewed and corrected by the clinician and preserved as permanent records of the hospital.

ORDER OF INSTRUCTION

The following summary shows the arrangement of the instruction in the subjects named for the several years and semesters. This order is subject to change, as adjustments of courses and lectures can not always be made to conform to an invariable schedule.

MATERIA MEDICA

1. *Materia Medica.* Lectures and recitations. Three times a week. Third and fourth years. Professor DEWEY.
2. *Therapeutic Principles.* Lectures and recitations. Once a week for a semester. First and second years. Professor DEWEY.
3. See *Theory and Practice*, Courses 4 and 6.

THEORY OF PRACTICE AND DIAGNOSIS

1. *Principles of Medicine.* Lectures and recitations. Once a week. First year. Professor HINSDALE.
2. *Medical Diagnosis.* Recitations and demonstrations. Twice a week. Second and third year. Dr. MELLON.
3. *Practice.* Lectures and quizzes. Once a week. Third and fourth years. Professor HINSDALE.
4. *Treatment.* Lectures and quizzes. Once a week. Fourth year. Professor HINSDALE.

5. General Medicine. Clinical Course. Two consecutive hours. Once a week. Third and fourth year. Professor HINSDALE.
6. Bedside Studies, Laboratory Diagnosis and Prescribing. Every day from 8 to 9 A. M. Fourth year students in parties of two. Professors HINSDALE and DEWEY and assistant.

MENTAL AND NERVOUS DISEASES

1. Lectures and Clinics. Once a week. Third and fourth years. Professor DEWEY and Dr. LONG.

SURGERY

1. Principles of Surgery. Once a week. Second year. Dr. FELLOWS.
2. Lectures and recitations. Three times a week. Third and fourth years. Professors SMITH and BURRETT.
3. Surgical Demonstrations Upon Cadaver. Class in sections. All day, for a week or until work is completed. Second semester. Fourth year. Professors SMITH and BURRETT.
4. Examination Clinic. Two hours. Twice each week. Third and fourth year students. Professors SMITH and BURRETT.
5. Surgical Clinic. Twice a week. Third and fourth years. Professors SMITH and Dr. NAYLOR.

GYNECOLOGY AND OBSTETRICS

1. Minor Gynecology. Lectures and recitations. Once a week. Third year. Dr. KINYON.
2. Major Gynecology. Lectures and recitations. Twice a week. Third and fourth years. Professor KINYON.
3. Obstetrics. Lectures and recitations. Twice a week. Third and fourth years. Professor KINYON.
4. Gynecological Clinic. Twice a week. Third and fourth years. Professor KINYON.

OPHTHALMOLOGY

1. Recitations. Twice a week. Third year. Second semester. Dr. ROWLAND.
2. Advanced work. Lectures and quizzes. Twice a week. Fourth year. First semester. Professor MYERS.
3. Refractions. Class in sections. Fourth year. One hour, twice a week. Professor MYERS.
4. Clinic. General and Operative. One hour. Five times a week. Professor MYERS.

OTO-LARYNGOLOGY

1. Recitations. Twice a week. Second year. Second semester. Dr. JACKSON.
2. Recitations. Twice a week. Third year. First semester. Dr. JACKSON.
3. Lectures and Quizzes. Fourth year. Twice a week. Second semester. Professor MYERS.
4. Clinic; General and Operative. One hour. Five times a week. Professor MYERS.

DERMATOLOGY

1. Lectures and Recitations. One hour a week. Junior class. Both semesters. Professor BURRETT.
2. Clinic. Two hours a week. Junior and senior classes. Both semesters. Professor BURRETT.

GENITO-URINARY DISEASES

1. Lectures and Recitations. One hour a week. Junior class. Both semesters. Dr. NAYLOR.
2. Clinic; General and Operative. Two hours a week. Junior and senior classes. Both semesters. Professor BURRETT and Dr. NAYLOR.

ELECTRO-THERAPEUTICS AND RADIOGRAPHY

1. Lectures and Recitations. One hour a week. Senior and junior classes. Second semester. Professor BURRETT.
2. Clinic. Two hours a week. Senior and junior classes. Both semesters. Professor BURRETT and Dr. FELLOWS.

SPECIAL PATHOLOGY

Laboratory Examinations and Analysis. Every afternoon. Class in sections. Six weeks. Two hours. Third year. Dr. MELLON.

HOSPITAL LABORATORY

Every morning. Specimens from hospital clinics. Class in sections. One hour. Dr. MELLON.

PHARMACY

1. Lectures and Recitations. Once a week. Second semester. Second year. Professor DEWEY.

**SUBJECTS PURSUED IN CONNECTION WITH CLASSES IN
OTHER DEPARTMENTS OF THE UNIVERSITY**

Chemistry (General, Organic, Physiological); Physics; Anatomy; Osteology; Histology; Embryology; Physiology; Bacteriology; Hygiene; Medical Jurisprudence; Organic Evolution; Botany. The

instruction in these subjects is given in connection with classes in the Department of Medicine and Surgery, the Department of Literature, Science, and the Arts, and the Department of Law. The nature, extent, and arrangement of these courses may be seen by reference to other pages of this Calendar.

EXAMINATIONS

At the end of each semester examinations (written, oral, or both written and oral) are held on all subjects taught during the semester, and each student's grade is entered upon the records of the Faculty. Students "*conditioned*" cannot apply for another examination in the same subject until the close of the next course or semester, except that a student conditioned at the close of the college year may ask for another examination in the first two weeks of the following year. Students reported "*not passed*" are required to take the course over again before applying for another examination.

REQUIREMENTS FOR GRADUATION

To receive the degree of Doctor of Medicine, a student must be twenty-one years of age and possess a good moral character. He must have completed the required courses in laboratory work, and have passed satisfactory examinations on all the required studies included in the full course of instruction. He must have been engaged in the study of medicine for the period of four years, the last of which must have been in this college.

GRADUATE COURSES

Medical science has made such rapid progress during recent years that graduates of a short time ago feel the necessity of returning to medical centres for supplementary study. The laboratories and special courses of this College offer superior advantages to graduates.

The nature of the work arranged for graduate students in hygiene, bacteriology, pathology, physiology, histology, chemistry, and anatomy may be learned by reference to pages 270 to 273.

In the practical branches, such as materia medica, physical diagnosis, surgery, ophthalmology, otology, laryngology, obstetrics, gynecology, dermatology, electro-therapeutics, and genito-urinary diseases, graduate instruction may be had, by special arrangement with the professors in charge, in connection with the demonstration courses given in the last two years.

OTHER FACILITIES FOR INSTRUCTION

Museums and Laboratories.—The museums of anatomy and materia medica, comprising thousands of specimens, models, and charts, afford the best means attainable for the close study of anatomy, physiology, pathology, and pharmaceuticals. The general and special cabinets of the University, containing about 255,000 specimens, are also open freely to all students. (Compare pages 56 to 62). The facilities for the study of chemistry, afforded by the chemical laboratory, are not excelled in any medical college in this country, and the arrangements for the laboratory work are such that medical students, in classes, and working under the direction of the professors in charge, receive practical instruction in the courses in qualitative chemistry, and in the analysis of fluids and secretions of the body, a knowledge of which has become absolutely indispensable to the successful physician. The histological laboratory, amply supplied with microscopes, sphygmographs, stereopticon, etc., offers rare facilities for the prosecution of practical work in experimental physiology and histology. The hygiene and anatomical laboratories are models of convenience, affording facilities for instruction in hygiene and in practical anatomy unsurpassed by those of any other institution of learning in the United States. For a fuller description of the laboratories of the University used by homœopathic students in common with students of other Departments, see pages 62 to 69, and pages 355 to 359.

Pathogenetic Laboratory.—A laboratory of experimental pathogenesis, in one of the Homœopathic Buildings is equipped with the necessary apparatus for experimentation with medical substances on the healthy human body, a special feature of this college. Proving is made, and each student is required to do a certain amount of original work and research in the pathogenic field. A complete course in homœopathic pharmaceuticals is also given in this laboratory.

Libraries.—The General Library of the University (see page 53), is open to the free use of students. Important additions have recently been made to the collection of works on Homœopathy. A large number of publications, domestic and foreign, are received regularly and kept on file in the library reading room.

Other Facilities.—Students in the College have the privilege of attending the scientific and philosophical lectures, collateral to medicine, given in the Department of Literature, Science, and the Arts. For a description of the gymnasiums, and the conditions on which they are open to students, see page 71.

THE UNIVERSITY HOMŒOPATHIC HOSPITAL

The University Homœopathic Hospital stands a little to the northeast of the University campus. It has a frontage of two hundred feet, and the ground plan resembles, in general, the letter T. Each end of the top line of the letter represents a ward, and the base is occupied by the operating and clinic rooms. The building extends back over the brow of a hill, and a rear view shows five stories in the clear. The general wards are planned each for sixteen beds. Sun parlors, one in front of each ward, are available as sitting-rooms for patients able to leave their beds. The plumbing is elaborate and of thorough construction. The building is heated by steam, and the ventilating system is guaranteed to change the air in the entire building every five minutes.

There are separate wards for children and for obstetrical patients. The facilities for training obstetrical cases have been largely increased. During the past year each senior student attended several cases of confinement.

The hospital is furnished with electrical appliances, and, under direction, skilled attendants apply electrical treatment. The junior and senior students receive special instruction in this subject.

Medical, surgical, gynecological, neurological, and ophthalmological clinics are held daily in the spacious amphitheater. Examinations of patients are made by the professors in charge, and by students under the direction of professors and assistants; prescriptions are given; and surgical operations are performed, in the presence of the class. The several clinics are held on separate days, of which the profession throughout the state will be notified at the opening of the University years.

Much attention is paid to physical diagnosis, and the abundance of clinical material furnishes many interesting cases. Students are required to take the history of patients, and, under proper supervision, make personal examinations and prescribe remedies. It is the aim of the Faculty to make clinical instruction systematic and thorough.

The hospital is kept open for patients during the college year, and also during the summer vacation. The expenses to patients are only for their board, for unusual appliances or special nursing, and for medicines, the services of the faculty being rendered gratuitously to those made available for clinical instruction.

Patients who desire to enter the hospital are requested to write to the Medical Superintendent to ascertain if there is room for their accommodation, and to obtain a circular giving more fully the rules governing admission.

Training School for Nurses.—In connection with the Hospital there are two nurses' homes, and a training school under the charge of a competent and experienced principal. The term of study and service extends through three years, at the expiration of which time those who have proved competent and trustworthy are granted certificates of graduation. For further information in regard to this school, application may be made to Miss GENEVIEVE REED, Principal, Ann Arbor, Michigan.

RULES GOVERNING PARTICIPATION IN PUBLIC ACTIVITIES

For the rules governing participation in public activities see page 83.

FEEES AND EXPENSES

The Matriculation Fee and the Annual Fee must be paid in advance, and no student can select his seat until after such payment. For the rules governing Second Semester fees and the refunding of fees see page 95.

Matriculation Fee.—For Michigan students, *ten dollars*; for all others, *Twenty-five dollars*.

Annual Fee.—For Michigan students, *fifty-seven dollars*; for all others, *sixty-seven dollars*.

Graduation Fee.—For all alike, *ten dollars*.

Laboratory Expenses.—In the laboratories, the fees for which are given in the following table, the student pays for the material used. The expense varies somewhat with the care and economy practiced:—

LABORATORY FEES

Anatomy	\$21.00
Chemistry	15.00
Bacteriology	15.00
Physiological Chemistry	15.00
Histology	10.00
Pathology	10.00
Physiology	5.00
Library and Hospital Laboratory	2.00

In addition to the foregoing the class in osteology make a deposit of five dollars with the anatomical laboratory for material which they can take to their rooms for individual study. The fee is refunded when the course is over, provided the material is returned.

Summary.—The total amount of fees paid to the University during the whole four years' course for matriculation, material used, incidental expenses and diploma is, for Michigan students, about \$295, and, for others, about \$350, varying a little with the student's actual laboratory expenses.

For additional information in regard to expenses see page 93.

Students arriving in Ann Arbor, and desiring further information, should apply at the office of the Dean. The office will be open daily during the latter part of September. Members of the Faculty, or other persons competent to give information, will be in attendance.

College of Dental Surgery

A special Announcement giving further information in regard to this Department is published annually. For copies of this Announcement, or for other information relating to the College, address The Dental College, Ann Arbor, Michigan.

The College of Dental Surgery was established as a Department of the University in 1875. The college year extends from the Tuesday preceding the first Thursday in October to the last Thursday in June (September 29, 1914, to June 24, 1915). The lectures close about June 16 in order to allow for the final examinations before Commencement.

REQUIREMENTS FOR ADMISSION

Applicants for admission must be at least seventeen years of age, and must have completed the requirements for admission, as here described. These requirements, which are the equivalent of a four year course in an approved high school, are stated in units, a unit meaning the equivalent of five recitations a week for one year in one branch of study. The subjects from which choice may be made, and the number of units which will be accepted in each subject, are as follows:

English Composition and Literature, 3 or 4 units.

Mathematics (Algebra and Geometry), 2 or 3 units.

Physics, 1 unit.

Chemistry, 1 unit.

Latin, 2, 3, or 4 units.

History (General, United States, and Civics), 1, 2, or 3 units.

Biology (Botany and Zoölogy), 1 unit.

Physiography, $\frac{1}{2}$ or 1 unit.

German, 2, 3, or 4 units.

French, 2, 3, or 4 units.

Trigonometry, $\frac{1}{2}$ unit.

Manual training, or One Year of Pupilage in a Dental Office, 1 unit. (Not more than 4 units may be offered in German and French).

Fifteen units are required for admission. These fifteen units must include at least three units in English, two units in Mathematics (elementary algebra and plane geometry), one unit in Physics, one unit in Chemistry, and two units in Latin. The other six units may be selected by the applicant from the foregoing list. The scope of the preparatory work is described on pages 100 to 110.

Applicants who cannot fulfill all these requirements may enter conditioned in not more than two units. These conditions must be removed by examinations at the time scheduled on page 111 before entering upon the second year of work.

Graduates of approved high schools, who present recommendation from the principal, are admitted without examination in the units covered by the diploma and recommendation.

All other applicants must pass examinations in the fifteen units. These examinations are conducted by the Department of Literature, Science, and the Arts, in accordance with the schedules printed on page 111.

REGISTRATION

Before admission to the examination, every student is required to present to the Dean of the Faculty his admission credentials before he can pay any fees. The matter of admission will be greatly facilitated by students sending their credentials to the Dean before leaving home. A special form for the purpose can be had on request to the Dean.

In order to receive credit for a full course, students must enter within ten days after the opening of the college year. It is very important that first-year students be present promptly at the opening of the year.

COMBINED LITERARY AND DENTAL COURSE

Students desiring to obtain the degrees of Bachelor of Arts in the Department of Literature, Science, and the Arts, and of Doctor of Dental Surgery in the College of Dental Surgery, may, by enrolling on the combined Literary and Dental course, shorten from seven years to six the time required to earn the two degrees. This privilege is open only to students who throughout their course maintain a uniform record of good scholarship. The work is under the direction of a Committee of five members representing the Department of Literature, Science, and the Arts, and the College of Dental Surgery. With the consent of the Committee in charge, a candidate for the degree of Bachelor of Arts, who has been a student in the Department of Literature, Science, and the Arts for at

least one year, and has 90 or more hours to his credit, of which at least 30 hours have been earned in the Department of Literature, Science, and the Arts of this University, may enroll upon the combined course; that is, while continuing his registration in this Department he may also register in the College of Dental Surgery, provided the work he has already completed includes a sufficient number of the courses enumerated below to enable him to complete within one year the specific requirements described in the following paragraph.

Students who desire to enter upon the Combined Literary and Dental Course must, in May of the year preceding double registration, file with the Registrar, on a blank to be obtained from him, a petition to be granted that privilege.

When the student so registered in the two Departments has completed the first year of the Dental Course, and not less than 90 hours in the Department of Literature, Science, and the Arts, he will be recommended for the degree of Bachelor of Arts, provided he has satisfied the requirements for graduation from the latter Department. (See page 116), and provided his work has included the following courses:

Rhetoric, 6 hours, including Courses 1 and 2.

French and German, 16 hours of either one, and 8 hours of the other.

Physics, 12 hours, including 4 hours of laboratory work.

Chemistry, general, qualitative, and organic, 14 hours for students presenting Chemistry for entrance, otherwise 18 hours.

Botany, 4 hours.

Zoology, 12 hours.

English, 6 hours.

History, 8 hours.

Total, 84 or 88 hours.

Suggested electives: Latin or Greek, 8 hours; Philosophy, 3 hours; Physical Chemistry, 3 hours.

ADMISSION TO ADVANCED STANDING

Persons *qualified for admission* to this college who have studied dentistry in other recognized schools for at least one year, may be admitted to advanced standing, after passing a satisfactory examination in the studies which have already been pursued by the class to which they seek admission.

ASSIGNMENT OF SEATS

Students are assigned seats in the lecture room, places in the dental laboratory, and chairs in the operating room, in the order in which they matriculate and register; and each student is expected to occupy the places so selected during the session.

COURSES OF INSTRUCTION

In the arrangement of the course, the aim is to accommodate and benefit students who desire a thorough dental education such as shall meet the expectation of the dental profession, and best serve the interests of the public. To this end a graded course of study is combined with a repetition of such lectures only as will avoid the confusion incident to the simultaneous presentation of too many parts of the general subject. The aim is to dismiss no subject until its relations to other parts of the course can be thoroughly appreciated.

SCHEDULE OF STUDIES*

FIRST YEAR	
<i>Subjects</i>	<i>Hours</i>
General Chemistry, Lectures and Laboratory,	200
Prosthetic Technics, Lectures and Laboratory,	800
Qualitative Chemistry,	180
Histology, Lectures and Laboratory,	180
SECOND YEAR	
Organic Chemistry, Lectures,	65
General and Practical Anatomy,	180
Prosthodontia, Lectures,	68
Bacteriology, Lectures and Laboratory,	180
Operative Technics, Lectures and Laboratory,	300
Dental Anatomy,	51
Physiology,	85
Dental Materia Medica,	34
Pathology,	51
Orthodontia Technics,	34
Crown and Bridge Technics,	120
Operative Clinics,	400
THIRD YEAR	
Dental Therapeutics,	68
Oral Surgery, Lectures and Hospital,	100
Orthodontia,	34
Crown and Bridge Lectures,	34
Orthodontia Technics,	34
Porcelain Technics,	34
Operative Dentistry, Clinical Lectures,	34
Operative Principles,	68
Pathology,	51
Prosthodontia and Orthodontia Clinic,	100
Operative Clinic,	600
Crown and Bridge Clinic,	272.
Dental Ethics, History and Literature,	34

* The column of hours gives the total number of hours of work required for each semester. The actual teaching weeks, exclusive of vacations and holidays, are 34 for the season, or 17 for each semester.

DESCRIPTION OF COURSES

Anatomy.—Anatomy is studied didactically and practically, and is taken in the Department of Medicine and Surgery (page 325). Special attention is given to students of dentistry on the anatomy of the head, face, neck, thorax, abdomen, and their contained viscera, and on the nervous and vascular systems. In practical anatomy the same regions are dissected. The work in anatomy also includes a course of lectures on comparative dental anatomy by a member of the Dental Faculty. The large odontological museum, the gift of the late Professor Ford, which has been greatly increased by a gift from Dr. William Mitchell, of London, England, offers exceptional opportunities for this work. There is also a course in human dental anatomy, which is in the nature of a series of quiz and laboratory exercises on technical anatomy, in cutting and studying the structure of human teeth in sections.

Embryology and Histology.—In general embryology and histology a combined lecture and laboratory course is given in which the student not only acquires a knowledge of the principal structures and tissues of the animal body, but also become familiar with the manipulation of the microscope and preparation of tissues.

Chemistry.—In chemistry students are required to attend separate lecture courses on general and organic chemistry, and also to take laboratory courses in qualitative and general chemistry.

Physiology.—A full course of lectures in general and special physiology is taken in the Department of Medicine and Surgery.

Bacteriology.—The course of bacteriology comprises lectures and laboratory work. In the laboratory the student becomes acquainted with technical methods and acquires experience in the biological study of the micro-organisms which are of general and special interest to the dentist.

Materia Medica and Therapeutics.—In dental materia medica and therapeutics a special course of lectures embraces the history, pharmacy, pharmacology, and therapeutics of all drugs and remedies used in the treatment of diseases occurring in dental practice. The course also includes a discussion of pain obtundents, local and general anæsthetics, and prophylactic remedies.

Pathology.—In dental pathology a course of lectures and laboratory work is given, which embraces a discussion of the various diseases which affect the teeth and mouth, and their etiology and treatment. Special attention is given to diseases which pertain especially to the practice of dentistry. Illustrative cases are shown to the class. All instruments, appliances, and methods that are of interest or value in this connection are exhibited and discussed.

Oral Surgery.—A course of lectures on clinical oral surgery embraces a consideration of diseases of the mouth and associated parts that are of special interest to the dentist, but which lie more within the province of the general surgeon for treatment. Illustrative cases are exhibited and discussed, and operations are performed before the class in the hospital clinic once each week, and in the Dental clinic as occasion requires.

Operative Dentistry.—In operative dentistry the instruction is both didactic and practical. In the didactic course, which is preceded by a course in operative technics, a full presentation of approved methods, appliances, and materials used in filling teeth is given, together with the principles which form the basis of practice. This instruction is supplemented by practical instruction in the clinical operating room, which is under the personal supervision of the professors of operative and clinical dentistry and their assistants. Here each third-year student is required to spend twenty hours each week at the chair, operating for patients, and in this way verifying the principles taught and obtaining such manipulative training as will result in desirable preparation for skillful practice.

Prosthetic Dentistry.—In prosthetic dentistry the instruction is both didactic and practical. In the lectures, the principles involved in the construction and application of artificial dentures, crowns and bridges, regulating devices, and continuous-gum and cleft palate work are fully discussed, and such methods as have proved valuable and worthy are advocated. In the practical department each student in the second and third years has opportunity and is required to construct and adapt to the mouth practical dentures for the restoration of lost dental organs.

The instruction in prosthetic technics embraces experimental construction of the various artificial dentures used to restore lost dental organs. It consists in taking impressions, making plaster models from impressions, making dies, swedging plates, grinding and adjusting teeth, soldering and finishing, vulcanizing and finishing plates, pouring and finishing cast metal plates, and constructing various styles of crowns, bridges, and regulating devices, with such instruction as will familiarize the student with the most approved methods of doing such work.

EXAMINATIONS

At the end of each semester examinations are held on all subjects taught during the semester. Students *conditioned* must remove the condition during the semester following the one in which it was received. No student who, at the end of a year, has failed to pass in two of the required subjects of his course is admitted to an advanced class during the first semester of the following year.

REQUIREMENTS FOR GRADUATION*

To be admitted to the degree of Doctor of Dental Surgery, the candidate must be twenty-one years of age, must possess a good moral character, must have devoted three years to the study of dentistry, and have passed all the examinations required in his course. Unless admitted to advanced standing, he must have attended three full years in this college, and he is advised to attend them consecutively.

ADVANCED COURSES

The purpose of the advanced course is to meet the requests of students for further opportunity to pursue the scientific branches of the regular college curriculum, and also to meet an often expressed wish on the part of practitioners to pursue some special scientific investigation, which has been entered upon at home, with limited resources in the way of books of reference, laboratory facilities, and apparatus, and without the aid of instructors or advisers in associated sciences.

The advanced course is open only to graduates of this college who have made marked records in their undergraduate work, and to graduates of this and other colleges who have had at least two years of continuous practice since graduation, and who have published original articles of scientific value, which show a capacity on their part for continuing such work with credit.

The course of study is independent of, and additional to, the regular undergraduate work, and embraces only such topics as will aid in training men to carry on scientific research in subjects, associated with practical dentistry, or with dentistry in its scientific aspect.

The time required to complete the course prescribed for the advanced degree depends upon the diligence and capacity of the student, but at least a year's work is required in all cases.

Advanced students are required to pay the same annual fee as undergraduates, and those who have not previously been matriculated in this University are also required to pay the usual matriculation fee. The expenses of the laboratory courses vary according to the character of the work taken.

The degree of Doctor of Dental Science (D.D.Sc.) is conferred only upon advanced students who complete the prescribed course as outlined above, or a course embracing an equivalent amount of scientific work.

* See footnote on page 414.

FACILITIES FOR INSTRUCTION

For general information relating to the University libraries, museums, laboratories, hospitals, and gymnasiums, see pages 53 to 69 and 355 to 359.

Among the facilities of special interest to students of dentistry the following may be mentioned:

FORD-MITCHELL MUSEUM

The dental museum is supplied with a large number of anatomical, physiological, pathological, and histological preparations, including a series illustrating dentition from infancy to the completion of the process of the adult, and the normal changes through life to old age, and also illustrative of the dental and osseous tissues. Preparations, natural and artificial, greatly facilitate the study of the nervous and vascular systems. The design is to make available every practicable appliance in this direction.

The odontological collection is probably the largest and best of its kind to be found in any dental college in the world. It comprises the entire set of crania and odontological specimens presented by the late Professor Ford, and has been recently more than doubled in size and value by the gift of the private collection of Dr. William Mitchell, of London, England, who has spent many years and large sums of money in bringing together material from all quarters of the world. Additions to this collection are desired, and gifts of material illustrating comparative odontology and typical or abnormal human teeth, will be gratefully received.

TAFT LIBRARY

A library of dental science (named in honor of the late Professor Jonathan Taft), containing almost every known work on this specialty, including an almost complete file of every dental journal published, is shelved in the dental building, where it is accessible to all students. A finely appointed reading room is connected with the library. Nineteen dental journals are regularly received.

TECHNIC LABORATORIES

The new Dental College Building contains two large technical laboratories accommodating one hundred twenty-five students each. They are fitted out with all new and modern appliances, such as:—Furnaces, soldering tables, rolling mills and electric lathes; appliance for the various manipulations of prosthetic dentistry, such as the construction of artificial dentures on gold, silver, aluminum, rubber, and other bases; appliances for the regulation of teeth and for the mechanical treatment of oral deformities and facilities for

the manufacture of instruments. Attention is given to the manipulation and management of the precious metals with reference to their use for dental purposes.

Each student is furnished a work bench for the instruments that he has to furnish for the prosecution of his work. If a student has any of these instruments it would be well to bring them; but it is more desirable to defer purchasing until the advice of the instructor in the college has been secured, as it is desirable that a complete and uniform outfit should be in the possession of each student. This outfit cost about fifty dollars, and if taken care of will be a permanent investment, as the tools will all be necessary and useful in practice. These tools must be purchased at the beginning of the course, as they are required during the first as well as during the succeeding years.

DENTAL OPERATING ROOMS

The operating rooms are large, well-lighted, heated, and ventilated. The main room contains eighty-five modern operating chairs, with brackets, fountain cuspidors, and cases for instruments. Other rooms contain chairs and apparatus for the administration of anæsthetics, for the extraction of teeth, and for other purposes. Each student is required to supply himself with a dental engine and a full set of operating instruments; these must be purchased with the advice of the instructor, and will cost about one hundred dollars. Like the laboratory tools, they will be necessary to begin practice, and if carefully used will last many years; consequently care should be exercised in their purchase. They need not be purchased until the last half of the second year.

The dental course is now given in a new building erected especially for this work, which is one of the best planned and equipped buildings for the purpose in the world.

COURSES IN OTHER DEPARTMENTS

Those who can command the time may also avail themselves of numerous lectures, or pursue elective studies, in the Department of Literature, Science, and the Arts (page 134); or may attend special lectures in the Department of Medicine and Surgery (page 347), such as those on gynecology and the diseases of children, or on other subjects that are important to the practicing dentist.

TEXT-BOOKS

A list of the text-books used and recommended is given in the special Announcement of the College, copies of which will be sent on request.

RULES GOVERNING PARTICIPATION IN PUBLIC ACTIVITIES

For the rules governing participation in public activities see page 83.

FEES AND EXPENSES

The Matriculation Fee and the Annual Fee must be paid in advance, and no seat will be assigned to a student until after such payment. For the rules governing Second Semester fees and the refunding of fees see page 95.

Matriculation Fee.—For Michigan students, *ten dollars*; for all others, *twenty-five dollars*.

Annual Fee.—For Michigan students, *seventy-seven dollars*; for all others, *one hundred seven dollars*.

Dental Laboratory Fee.—Payable each year, *ten dollars*.

Graduation Fee.—For all alike, *ten dollars*.

Laboratory Expenses.—*Chemical Laboratories.*—Students are required to pay for the material and apparatus consumed by them. The average expenses for the required courses is about *ten dollars* each. *Histological Laboratory.*—A charge of *seven dollars* is made for material used in this laboratory. *Bacteriological Laboratory.*—A charge of *fifteen dollars* is made for the expense of the course in this laboratory. *Anatomical Laboratory.*—A charge of *ten dollars* is made for material used in dissecting.

Incidental Expenses.—The expenses, for incidentals, teeth, rubber, and other material needed in the technical courses, but not supplied by the University, are about *fifteen dollars* for each year.

The average total expenses of a student of dentistry, including University fees, board, books, etc., for the college year of nine months are three hundred fifty dollars, and upwards, depending on individual habits and tastes. The cost of instruments and tools, amounting to about one hundred fifty dollars for the entire course, is not included in the above estimate, for the reason that it is not properly a college expenditure, the tools being available and necessary in future practice.

To avoid embarrassment, new students should come prepared to spend during the first week about \$140, if residents of Michigan, or \$175, if not residents of Michigan, for University fees, books, and tools.

Additional information in regard to expenses may be found on page 93.

Graduate Department

A special announcement giving additional information in regard to the Graduate Department is issued annually in March. For copies of this Announcement, and for information concerning admission and courses of study which is not given in the Announcement, address Professor Karl E. Guthe, Dean of the Graduate Department.

The first graduate student at the University is recorded in the catalogue of 1856. The degrees of Master of Arts and Master of Science were earliest conferred, the degree of Doctor of Philosophy being offered for the first time in 1875. Changes made in studies in 1877-1878 had an important bearing on graduate work at the University. This was due to the multiplication of electives and the introduction of the credit system. The seminary method of instruction began then to assume considerable proportions, and the movement was strengthened by a growing demand for better trained teachers.

In the spring of 1892 a Graduate School was organized in connection with the Department of Literature, Science, and the Arts. Thus provision was made for a more systematic and efficient administration of higher work, and, so far as possible, for the separate instruction of graduate students.

In the fall of 1912 the Graduate School was reorganized as the Graduate Department so as to include graduate work in all Departments of the University. The management of the Graduate Department is vested in an Executive Board of seven, together with the President and the Dean of the Department.

ADMISSION AND REGISTRATION

ADMISSION

The privileges of the Graduate Department are open to graduates of any Department of this University requiring a four-year course for graduation, and to graduates of other universities and colleges of recognized standing who are qualified to pursue with profit the advanced courses of study offered in the University. But admission to study in the Department does not imply necessarily admission to candidacy for a degree.

Graduates of other institutions whose course of study is not substantially equivalent to that prescribed at this University are required to do an additional amount of undergraduate work before being admitted to formal candidacy for an advanced degree.

For information in regard to enrollment for graduate study in the Summer Session, see page 436.

REGISTRATION

Every applicant for admission to the Graduate Department must present himself with his credentials to the Dean, and submit a certificate of graduation from the institution from which he comes, which certificate shall specify the degree he has obtained, the courses he has completed leading to his bachelor's degree, the scholarship grades or marks attained or received in each course, and the basis of the grading or marking in force in said institution.

All students of the Graduate Department, *whether registered in a previous year or not*, are required to register with the Dean at the beginning of each year of residence. *Such registration must be made at the beginning of the year to insure recognition that the residence requirement has been met.*

Blanks showing the course of study the student is pursuing must be filed at the beginning of each semester or Summer Session at the office of the Graduate Department.

Undergraduates of this University, who at the beginning of a given semester are within three hours, or at the beginning of a Summer Session within two hours, of graduation, may be permitted to register in the Graduate Department and have that semester or Summer Session counted toward the residence requirement for a higher degree. Such students must pay the fees required in the undergraduate Department in which they are primarily registered.

Students who finish the undergraduate course of this University at the end of the first semester and who continue their residence for the remainder of the year, are permitted to register in the Department and thus secure the privileges of its membership, even though the bachelor's degree is not conferred until the close of the year.

Applicants who do not wish to become candidates for a degree, may be admitted and registered as special graduate students. Such graduate students must designate, and have approved by the Dean, the general lines of study which they wish to pursue.

Students who withdraw from the University during the academic year are requested to inform the office without delay of such withdrawal.

Changes of subjects originally selected must be reported to the Dean for approval.

UNIVERSITY FELLOWSHIPS

Ten University Fellowships with an annual value of \$300 and five with a value of \$500 each have been established by the Board of Regents. Applications for appointment to these fellowships, which are open to graduates of any college or university of recognized standing, must be made to the Dean of the Graduate Department upon special blanks obtainable from him upon request.

Each fellow shall pursue his studies under the direction of the professors in charge of the departments in which he elects his subjects, see pages 424 to 431, and shall be liable to render service to the University to the extent of not over four hours per week throughout the academic session for which he is appointed. This service to the University may be in conducting classes or quizzes, assisting in laboratory work or examinations, or attendance in the libraries or seminaries.

Fellows are appointed for a term of one year, but may be eligible for reappointment.

Holders of fellowships are required to pay the matriculation fee (if not already paid), the annual fees, the diploma fee, laboratory expenses, and similar charges, the same as other students of the department in which their work lies.

Applicants for appointments to these fellowships should be made to the Dean of the Graduate Department before March 1 of the year preceding the appointment.

STATE COLLEGE FELLOWSHIPS

By the action of the Board of Regents of the University of Michigan, the faculties of ten colleges in the State of Michigan, are authorized to nominate each year to the administrative officers of the Graduate Department, some member of their respective senior classes, or one of their graduates of not more than four years' standing as a suitable candidate for a State College Fellowship, with a stipend of \$300, for the next academic session. Such candidates, when duly appointed by the Board of Regents, shall be placed on the same footing, and be subject to the same regulations as the University

Fellows, see above. All nominations, accompanied in each case by a brief statement of the nominee's fitness for appointment, and an indication of the lines of graduate work he expects to pursue, should be on file in the office of the Graduate Department not later than May 15. Each college should also nominate an alternate to the regular candidate.

OTHER FELLOWSHIPS

For other fellowships open to students enrolled in the Graduate Department, see page 85.

CHARACTER OF GRADUATE WORK

The essential feature of graduate work is specialization of study. Every graduate student is expected to acquire an intimate knowledge of his field of study and of the methods employed in this field so that he will be able to approach his subject in an independent and critical spirit. After a student has selected the department of study in which he wishes to specialize, his work will be under the immediate supervision of a committee appointed by the Dean. This committee, in consultation with the student, will arrange a course of study suited to his desires, needs, and previous attainments, will assist him in the choice of a subject for a thesis, pass judgment upon his thesis when it is written, conduct his examination, and, if the examination is creditably sustained, report him to the Executive Board as worthy of the degree sought. The nature of the work prescribed, and of the committee's supervision, varies according to the subject chosen, the degree sought, and the previous attainments of the student. The work may consist of attendance upon certain specified courses of study, of reading to be done privately and reported upon, or of original research to be carried on more or less independently.

A student may elect work in more than one Department provided the courses chosen form a coherent group. Advanced undergraduate courses will be accepted in partial fulfillment of the requirements for a degree under conditions prescribed by the Executive Board. It is expected that all work done by a graduate student will be of superior grade.

Although the work of the Graduate Department is in large part planned with reference to the needs of those who desire to specialize in definite subjects, the opportunities of the Department are open to other students as well. A number of departments have arranged courses designed mainly to meet the needs of teachers who are unable to attend classes except on Saturdays. Students electing these courses are at first registered as special students and not as candidates for a degree, but will be accepted as candidates, if they show exceptional ability.

DEGREES CONFERRED

The degrees conferred on the completion of approved courses of study in the Graduate Department are Master of Arts, Master of Science, Master of Science in Forestry, Master in Landscape Design, Master of Science in Engineering, Master of Science in Public Health, Mechanical Engineer, Civil Engineer, Electrical Engineer, Doctor of Philosophy, Doctor of Science, and Doctor of Public Health.

THE MASTERS' DEGREES—A.M., M.S.

A student who has been admitted to study for the master's degree may be recommended for the degree after one year of resident study at this University provided that the year has been spent in taking full work in studies of graduate grade, and that he passes a satisfactory examination.

The degree of Master of Arts is the one usually conferred, though candidates who pursue scientific studies may at their option receive the degree of Master of Science.

The work done in residence is mainly in courses of study regularly announced, but private work is often undertaken under special direction.

A student who has received the bachelor's degree from a college not of sufficiently high standing, or who has not previously taken such courses as are required in preparation for graduate work, must expect to spend more than one year in residence, the length of time to be determined in each case by the character of his previous work and the quality of his work in this Department.

All graduate students taking regularly announced courses of study are expected to attend the examinations given in such courses.

A committee consisting of not less than three examiners will conduct a final examination on the graduate work taken by the candidate and report the result of such examination to the Executive Board.

MASTER OF SCIENCE IN FORESTRY—M.S.F.

The work of candidates for the degree of Master of Science in Forestry is under the immediate supervision of the professor of Forestry and consists mainly of prescribed courses. The department of Forestry publishes annually a special Bulletin which contains full information concerning the work leading to this advanced degree.

Candidates for the degree of Master of Science in Forestry may be conveniently divided into three classes:—

1. Graduates of this University who have received either the degree of Bachelor of Arts or Bachelor of Science and have completed the courses prescribed for the first four years by the department of Forestry. Such students are usually permitted to complete the requirements for the Master's degree in one year.

2. Graduates of this University and of other institutions of recognized standing, who have successfully pursued courses in general science approximately equivalent to those prescribed for the first four years, are required to spend two years in residence in order to obtain the Master's degree.

3. Graduates of this University and of other colleges and universities of approved standing, whose preparation is deficient in some of the important required courses, notably in botany and in other natural history subjects, are required to spend a longer period in order to satisfy the requirements for the degree of Master of Science in Forestry. This period will depend upon the preparation and ability of the student.

Candidates for the degree of Master of Science in Forestry are subject to the same regulations as candidates for the degree of Master of Arts or of Master of Science. See page 425.

MASTER IN LANDSCAPE DESIGN—M.L.D.

Graduates of this University with the degree of Bachelor in Landscape Design will receive the degree of Master in Landscape Design upon the successful completion of the requirements for the same. The graduate work in Landscape Design consists largely of prescribed courses and may, in general, be completed in one year. A special bulletin giving full description of courses in Landscape Design may be had upon application to the Secretary of the University.

MASTER OF SCIENCE IN ENGINEERING—M.S.

All students wishing to study for an advanced degree in Engineering must have received the bachelor's degree from this University, or from some other university or technical school of recognized standing. According to the previous training in engineering studies, two classes of students may be distinguished.

A

A graduate from the Department of Engineering of this University or from a technical school of recognized standing who wishes to continue his work in the same branch of engineering study in which he has received the corresponding bachelor's degree, will find it possible to complete the work required for the master's degree in one year, provided his work proves to be of superior grade.

B

A graduate whose training in engineering has not been equivalent to the course offered by the Department of Engineering of this University must expect to spend more than one year in the Graduate Department before he will be allowed to receive his degree. The length of time varies with the previous attainments of the student and the character of his work. Unless previously completed, the

equivalent of the following undergraduate courses must be taken by the student before being admitted as a candidate for the degree of Master of Science in Engineering: the English, Foreign Language, Mathematics, Physics, Chemistry, Descriptive Geometry, and Engineering Mechanics required of all students except architects in the Department of Engineering, and in addition at least fifteen hours of the fundamental technical requirements of the group in which he desires to specialize.

A student prescribing the minimum requirement must spend at least two years on an approved course of study and complete it with more than average standing.

Should a student be required to take more than a year's work from the undergraduate courses above mentioned, he will not be allowed to enter the Graduate Department, but must enroll in the Department of Engineering.

After the student has selected the department of study in which he wishes to specialize, his work will be under the immediate supervision of a committee appointed by the Dean, of which committee the head of the department concerned shall be the chairman. This committee will assist the student in the choice of a thesis, and conduct, previous to recommendation for the degree, a final examination covering the courses pursued by the candidate, and the thesis.

MASTER OF SCIENCE IN ARCHITECTURE—M.S.

All students wishing to study for the degree of Master of Science in Architecture must hold the corresponding bachelor's degree from this University or some other institution of recognized standing. The graduate work must be of advanced character, a thesis in the design and construction of some building being required in the second semester of the graduate year.

All students in this course are subject to the general regulations of the Graduate Department.

MASTER OF SCIENCE IN PUBLIC HEALTH—M.S.

Candidates for the degree of Master of Science in Public Health must possess the degrees of Bachelor of Arts or Bachelor of Science and Doctor of Medicine. The course of instruction covers one academic year, beginning with the opening of the University in the fall, and continuing until the following June. Work in the Summer Session following the granting of the degree of Doctor of Medicine may be credited on this course. At the close of the course an examination, both theoretical and practical, will be held, and a diploma of Master of Science in Public Health will be given to all who successfully pass the examinations and show fitness for work in public health. In addition to the taking of the prescribed courses and the

successful passing of these courses the candidate shall carry out a piece of original investigation of sufficient value, and shall present a thesis on the same, and successfully defend this thesis. The moral character of applicants for the degree must be shown to be above question.

All candidates for the above degree are subject to the rules and regulations of the Graduate Department.

WORK IN ABSENTIA

The practice of allowing students to enter upon studies *in absentia* as candidates for a master's degree has been discontinued. But a graduate of this University, who has already completed a considerable portion of the term of residence prescribed for a master's degree, may be allowed to continue his studies for the degree without further residence at the University, on such conditions as the Executive Board may determine in each case. *This privilege is restricted to graduates of this University.* Candidates for the master's degree who find it necessary thus to complete a portion of their work *in absentia* are required to petition the Executive Board through the Dean for such privilege, and if the petition is granted, they must keep the Dean informed of their continued connection with the Department and of the progress of their work.

THE ENGINEER'S DEGREE

Civil Engineer—C.E.; Mechanical Engineer—M.E.; Electrical Engineer—E.E.; Chemical Engineer—Ch.E.; Naval Architect—Nav. Arch.; Marine Engineer—Mar.E.; or Architect—Arch.

These advanced degrees will be conferred only upon persons who have proved their ability to plan and direct professional work or original investigation in applied science.

A candidate for any of these degrees must have received a bachelor's degree from an approved college, at least five years before registration for the advanced degree. He must have been engaged in professional work, in responsible charge of the same for at least one year, and must present at the time of registration a detailed account of his professional experience to that time, which must be approved by the Executive Board after consultation with the head of the department in which the degree is sought.

He must have pursued before receiving the degree an amount of advanced study equivalent to at least one year's work at the University, which work must have been performed under the direction of a special committee. Those who have received the degree of Master of Science in Engineering from this Department may be excused

from part of the advanced study required, in case the work done for the master's degree is, in the opinion of the committee, acceptable towards the higher degree.

He must also present a satisfactory thesis giving evidence of his professional attainments and his fitness to receive the degree sought.

THE DOCTOR'S DEGREES—Ph.D., Sc.D.

The Doctor's degree is conferred solely in recognition of marked ability and scholarship in some relatively broad field of knowledge such as the Ancient Languages, Philosophy, History, Political Science, Physics, Chemistry, etc. For this purpose the student will be required to work under the direction of a special committee. A portion of the work consists in pursuing regularly announced graduate courses of instruction in the chosen subject, and in such cognate subjects as may be selected by the student and approved by the committee. However, the principal method of developing a mastery of the subject consists in pursuing independent research work in some subdivision of the selected subject, and the scholarly presentation of the result of such investigation in the form of a thesis.

No definite term of required residence can be specified. As a rule, three years of graduate study are necessary, the last two semesters of which must be spent at this University. This last requirement may be waived, however, in the case of Bachelors of this University who have spent one year in residence pursuing courses leading to an advanced degree. Credit may be allowed for graduate courses taken in other universities of recognized standing.

A student wishing to become an applicant for the doctor's degree must first present himself to the Dean, indicating on a blank furnished for that purpose the department in which he wishes to work. The supervision of the student's work will then be entrusted to a special committee.

Not every applicant for the doctor's degree will be accepted as a candidate. A student wishing to become a candidate for the doctor's degree must make a formal application to be so enrolled at least two semesters prior to the time for presenting himself for examination. At this time the subject of the thesis must be chosen and approved by the committee concerned.

No student shall be registered as a candidate for the doctor's degree until he has done one year of satisfactory graduate work in the Graduate Department of this, or some other university of recognized standing.

No student will be accepted as a candidate for the doctor's degree who has not a knowledge of French and German sufficient for purposes of research.

The degree of Doctor of Philosophy is the one usually conferred, though candidates who pursue studies along scientific lines may at their option receive the degree of Doctor of Science.

DOCTOR OF PUBLIC HEALTH—D.P.H.

Candidates for the degree of Doctor of Public Health must possess the degree of Bachelor of Arts or Bachelor of Science in addition to that of Doctor of Medicine, and must pursue a course of two years after the degree of Doctor of Medicine has been received. The first year's course is identical with that prescribed for the degree of Master of Science in Public Health. The second year's work must be spent in research work in one or more of these subjects, with the presentation of a thesis containing original work of sufficient merit, which must be passed upon by and defended before all the members of the Faculty concerned in the giving of the courses. The final examination will cover the branch or branches of the first year's work, and can be held at the end of the first year. A portion of the prescribed work may be taken elsewhere, but the right to do this must be left with the special committee in charge of the candidate's work.

THE DOCTOR'S THESIS

The thesis must exhibit creditable literary workmanship, but its acceptance depends more upon its subject-matter than upon its rhetorical qualities. It must be an actual contribution to knowledge and must be founded upon the author's own investigations carried on under the direction of his committee. The treatment should be as concise as the nature of the subject permits. Every thesis should contain a clear introductory statement of the problem investigated, and likewise a final résumé of results. It should be preceded by an analytical table of contents, with page references, and a full list of the authorities consulted. The larger divisions and the more important minor divisions should be indicated by suitable headings. It is expected that the preparation of an acceptable thesis will usually require the greater part of an academic year.

The thesis must be completed and a good legible copy placed in the hands of the Dean of the Graduate Department as early as the first of May of the year in which the applicant expects to take the degree. If the examination of the candidate is to take place on some other date than in the month of June the thesis must be in the hands of the Dean at least one month before the candidate can present himself for examination.

Every candidate for the degree of Doctor of Philosophy, Doctor of Science, or Doctor of Public Health, in case of the acceptance of his thesis, is required to have the thesis printed in full or in part, as may be approved by the responsible committee. To guarantee the printing of the thesis, he is required to deposit with the Treasurer of the University, between the date of the acceptance of the thesis and the time fixed for his examination, the sum of fifty dollars. This deposit will be returned to him in case of failure to pass his examination, or whenever he shall cause his thesis to be printed at his own expense, or shall have it published in a form and under auspices

approved by the responsible committee. The candidate is required to deposit one hundred and fifty copies of the printed thesis in the University library, these copies to be used for exchange with other universities. Provision has been made, however, that in cases where this requirement would work hardship, it may be waived on recommendation of the candidate's committee.

In the printing of the thesis at his own expense the candidate will be expected to use good, substantial paper, and slightly typography. A page four inches by six, with outside margins of at least one inch, is recommended. The thesis must be bound with cover and title-page, and the latter, in addition to the title and name of the author, must bear the following inscription: A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy (or of Science, or of Public Health), in the University of Michigan. In case the thesis is not immediately printed, a typewritten copy must be placed in the University library.

EXAMINATIONS

The final examinations of candidates for the higher degrees are commonly held during the first part of June; but the examinations can usually be arranged at any time when a candidate has fulfilled all the technical requirements and has satisfied his instructor that his work has been such as to warrant an examination.

Ordinarily the examinations are oral, and in each case they are held before those comprising the special committee in charge of the candidate's work and before such others as may be present by invitation of this committee. They may be preceded by such written tests as individual instructors consider necessary.

Candidates in attendance upon regular courses in which stated examinations are held, whether during the semester or at its end, are expected to take these examinations with the classes concerned unless definitely excused from so doing.

On the examinations of candidates for the master's degrees see page 425.

RULES GOVERNING PARTICIPATION IN PUBLIC ACTIVITIES

For the rules governing participation in public activities see page 83.

SUMMER SESSION

Graduate students who are regularly matriculated in the University, may carry on work during the Summer Session which will count toward an advanced degree. Graduates of other universities or colleges of similar standing, who are competent to enroll for a higher degree, may, upon the payment of a fee of twenty-five dollars, matriculate in the University and begin graduate study during the

Summer Session. This fee of twenty-five dollars includes the regular matriculation fee and the fee for the current Summer Session.

Candidates for the master's degree, if graduates of the University of Michigan, may present themselves for examination after attendance upon three Summer Sessions of this University, supplemented by satisfactory work done *in absentia* under the direction of the proper committee.

Graduates of other institutions, who have been admitted to candidacy for the master's degree, may present themselves for examination after attendance upon two Summer Sessions and one semester's residence in the University, or after attendance upon four Summer Sessions, supplemented by satisfactory work done *in absentia* under the direction of the proper committee.

Full information concerning graduate courses in the Summer Session may be found in the Announcement of the Summer Session. This Announcement may be obtained from the Secretary of the Summer Session.

FEEES AND EXPENSES

The Matriculation Fee and the Annual Fee must be paid in advance. For the rules governing Second Semester fees and the refunding of fees see page 95.

Matriculation Fee.—For Michigan students, *ten dollars*; for all others, *twenty-five dollars*.

Annual Fee.—For Michigan students, *forty-two dollars*; for all others, *fifty-two dollars*. The annual fee required for all graduates who are granted the privilege of pursuing studies for a master's degree *in absentia* is *ten dollars*.

Summer Session Fee.—For matriculates, *twenty dollars*; for non-matriculates, *twenty-five dollars*. See Summer Session above.

Part Time Fee.—Persons engaged in teaching in public, parochial or private schools who are regularly admitted as students in the Graduate Department, may elect not more than five hours a week, upon the payment of a fee of *ten dollars* in lieu of the regular annual fees. Such students must pay the matriculation fee the same as other students.

Graduation Fee.—For all alike, *ten dollars*. A fee of *two dollars* is charged for the Teacher's Diploma.

For laboratory fees and other expenses, see page 93.

Summer Session

A special Announcement of the Summer Session, containing further particulars than here are given in regard to the courses of instruction, etc., is published annually. Copies of this Announcement can be had by addressing Mr. Shirley W. Smith, Secretary of the University.

In the Summer Session of the University, courses of instruction are offered in the Department of Literature, Science, and the Arts, the Departments of Engineering and Architecture, the Department of Medicine and Surgery, the Department of Law, and the School of Pharmacy. The University also maintains a Summer School of Library Methods, and a Summer Biological Camp located on Douglas Lake in Cheboygan County, Michigan.

While these courses are, for the most part, equivalent in every respect to the courses given during the Academic Session, special advantages are offered to advanced and graduate students.

The Administration of the Summer Session of 1914 is in charge of EDWARD H. KKAUS, Acting Dean, and the following Secretaries: THOMAS E. RANKIN, Department of Literature, Science, and the Arts; JAMES P. BIRD, Departments of Engineering and Architecture; CHARLES W. EDMUNDS, Department of Medicine and Surgery; EDWIN C. GODDARD, Department of Law; A. B. STEVENS, Acting Dean of the School of Pharmacy; KARL E. GUTHE, Dean of the Graduate Department; CLARENCE T. JOHNSTON, Director of the Bogardus Engineering Camp; and HENRY A. GLEASON, Acting Director of the Biological Station.

In the summer of 1914 the session will open on Monday, June 29, and continue for eight weeks, except in the Departments of Medicine and Surgery, and of Law. The session in the Department of Medicine and Surgery is six weeks in length. In the Department of Law the session will open on Monday, June 22, and will continue for ten weeks.

REQUIREMENTS FOR ADMISSION

There are no formal requirements for admission to the Summer Session and its courses are open to all persons qualified to pursue them to advantage. Students who have been dismissed from the University will not be allowed to enter the Summer Session without the consent of the Dean of the Department of which they were members.

REGISTRATION

In order to facilitate arrangements for the accommodation of prospective students, it is urged that all persons contemplating work in the Summer Session should notify the Secretary on or before June 22. The offices of the University Treasurer and of the several Secretaries will be open for the registration of students on Friday and Saturday, June 26 and 27. So far as possible, it is expected that all students will arrange to reach Ann Arbor by June 27, in order to secure rooms and to register.

Students desiring to pursue courses in law are requested to register on June 19 and 20, as the work in that Department begins on June 22.

To register the student must enroll with the Secretary of the Department in which he wishes to pursue studies, and pay his fees to the Treasurer. No student will be admitted to classes in any department except upon presentation of the Treasurer's receipt.

CREDIT FOR COURSES

Regular students of the University will receive credit toward graduation for work done in courses of University grade, upon passing satisfactory examinations at the close of the session. A record is kept of all University credits earned by students and these credits may be applied toward a degree in case the student becomes, subsequently, a candidate for a degree. The number of hours credit allowed for courses offered in the various departments is indicated in connection with the description of the courses, and where no such mention is made, no credit is given. Since the work of the Summer Session is equivalent to similar work of the academic year, it is now possible for a student to secure the degree of Bachelor of Arts or Bachelor of Science by attendance upon three academic and three summer sessions. Similar reductions in time are also possible in all other Departments save that of Medicine and Surgery.

In the Departments of Literature, Science, and the Arts, and of Engineering and Architecture, the maximum amount of credit given for work done in any one Summer Session is eight hours.

Requests for further information concerning credits should be addressed to the Secretary of the Department in which credit is desired.

CREDIT CERTIFICATES

Students of the Summer Session who are not matriculated in the University will, upon request, receive certificates of attendance and of work satisfactorily performed. Application for these certificates must be made at least two weeks before the close of the Session, and the applicant must leave at the office of the Secretary, in

which he is enrolled, an envelope, stamped and directed to his home address. The certificate will then be forwarded by mail.

GRADUATE WORK

All graduate courses are open to students who are properly qualified to pursue them. Graduate students who are regularly matriculated in the University and properly registered with the Dean of the Graduate Department, may carry on work during the Summer Session which will count toward an advanced degree. (See matriculation, page 436.)

Candidates for the master's degree, if graduates of the University of Michigan, may present themselves for examination after attendance upon three Summer Sessions of the University, supplemented by satisfactory work done *in absentia* under the direction of the proper committee. Graduates of other institutions may present themselves for examination for such degree either after attendance upon four Summer Sessions or after two Summer Sessions and one semester's residence in the University.

Candidates for the doctor's degree will find that the Summer Session offers unusual opportunities for research work. Detailed information concerning the requirements for the doctor's degree may be obtained from the Dean of the Graduate Department.

MATRICULATION

Formal admission to the University and payment of a matriculation fee are not required for students of the Summer Session. Those who so desire, however, may be admitted and matriculated upon presentation to the Dean

of the Department they desire to enter, of proper credentials fully covering the requirements for admission.

Persons desiring to matriculate at this time should mail their credentials to the Dean of the Department concerned, at least one month before the opening of the Summer Session.

The matriculation fee, which is ten dollars for a citizen of Michigan, and twenty-five dollars for a person who comes from any other State or country, is paid but once, and entitles the student to the privileges of permanent membership in the University.

Graduates of any reputable college or university, who in the judgment of the Dean of the Graduate Department are competent to enroll for a higher degree, may, upon the payment of a fee of twenty-five dollars, matriculate in the University and enter upon graduate study during the Summer Session. This fee of twenty-five dollars includes the regular matriculation fee and the fee for the current Summer Session.

FEES

The fee for the Summer Session in the Departments of Literature, Science, and the Arts, and of Engineering and Architecture, in the School of Pharmacy, and in the Graduate Department, is \$20.00, regardless of the number of courses taken. This fee will be required of those who wish to attend as visitors, as well as of those who wish to do regular work and attend the examinations.

In the Department of Medicine and Surgery, the fee is \$15.00 for laboratory and demonstration courses, and \$25.00 for the more strictly clinical courses, regardless of the number taken.

In the Department of Law the fee is \$10.00 for a single subject, or \$25.00 for full work.

The fee for the courses in Embalming and Sanitary Science is \$60.00.

Each student will be required to register in the Department in which the major part of his work is done, and if he desires to elect work in another Department in which the fee is higher, he will be required to pay an additional fee of \$5.00 for each course so elected. The maximum fee for any student is \$25.00. It is to be understood that in all cases where laboratory or demonstration fees are required, such fees are to be paid in addition to the regular Summer Session fee.

Each student registered in the Summer Session in any Department is required to pay a University Health Service Fee of fifty cents. (See page 81.)

For additional information concerning fees and expenses, see page 93, and also under Matriculation, page 436.

COURSES OF INSTRUCTION

The following courses were given during the Summer Session of 1913:

DEPARTMENT OF LITERATURE, SCIENCE, AND THE ARTS

1. Homer's Iliad; Selections. *Two hours.* Dr. ROBBINS.
 13. Lucian, Dialogues. *Two hours.* Dr. ROBBINS.
 29. Ancient Athenian Life. *Two hours.* Dr. ROBBINS.
- FOR GRADUATES
21. Pindar. *Two hours.* Dr. ROBBINS.

LATIN

- SY. Beginning Latin. Professor MEADER.
- SZ. Caesar's Gallic War. Assistant Professor CRITTENDEN.
- S4. Virgil's Aeneid, Books VII to IX. *Two hours.* Assistant Professor CRITTENDEN.
- 4a. Roman Literature. *Two hours.* Assistant Professor CRITTENDEN.
- S6. Rapid Reading. *Two hours.* Assistant Professor CRITTENDEN.

- 21c. Teachers' Course in Cicero. *Two hours.* Assistant Professor CRITTENDEN.
 S7. Latin Writing. *Two hours.* Assistant Professor CRITTENDEN.
 10c. Architectural History. *Two hours.* Professor KELSEY.

FOR GRADUATES

- 18a. Latin Language. *Two hours.* Professor MEADER.
 13c. Petronius and Martial. *Two hours.* Professor KELSEY.

FRENCH

1. Beginners' Course. See Department of Engineering.
 2. French of the Second Semester. *Four hours.* Mr. WANN.
 3. Second Year French. *Four hours.* Dr. FAY.
 3s. Modern Prose. *Two hours.* Mr. McLAUGHLIN.
 7. Advanced Composition. *Two hours.* Professor CANFIELD.
 13s. Conversation. *Two hours.* Professor LEVI.
 51. Modern French Fiction. *Two hours.* Professor EFFINGER.
 52. Drama of the Nineteenth Century. *Two hours.* Professor EFFINGER.

FOR GRADUATES

31. Introduction to Old French Philology. *Two hours.* Professor CANFIELD.
 53. The Early Works of Victor Hugo. *Two hours.* Professor CANFIELD.
 54. French Fiction. *Two hours.* Professor EFFINGER.

ITALIAN

- 1s. Beginners' Course. *Four hours.* Mr. McLAUGHLIN.

SPANISH

1. Beginners' Course. *Four hours.* Assistant Professor WAGNER.
 3. Modern Prose. *Two hours.* Assistant Professor WAGNER.
 11. Teachers' Course. *Two hours.* Assistant Professor WAGNER.
 Graduate Work.

GERMAN

1. Beginners' Course. See Department of Engineering.
 2a. Grammar. Reading of easy German stories, with practice in speaking and writing German. *Two hours.* Assistant Professor FLORER.
 3a. Modern Prose. *Two hours.* Assistant Professor SCHOLL.
 3ea. Scientific German. *Two hours.* Assistant Professor SCHOLL.
 5. Goethe's *Iphigenie* and *Tasso*, or Lessing's *Nathan der Weise*. *Two hours.* Assistant Professor EGGERT.

9. German Composition. *Two hours.* Assistant Professor EGGERT.
- 9c. Advanced German Conversation. *Two hours.* Assistant Professor FLOER.
11. Studies in Schiller's *Wilhelm Tell*. *Two hours.* Professor HILDNER.

FOR GRADUATES

- 9a. Advanced Course in German Composition, or German Essay Writing. *Two hours.* Professor DIEKHOFF.
13. Advanced German Grammar. *Two hours.* Professor DIEKHOFF.
27. Introduction to Middle High German. *Two hours.* Professor DIEKHOFF.
29. Old High German. *Two hours.* Professor DIEKHOFF.
15. Goethe's *Faust*. *Two hours.* Professor WINKLER.
19. German Romanticism. *Two hours.* Professor WINKLER.
39. Proseminary in Goethe, Schiller, or Herder. *Two hours.* Professor WINKLER.
- 19a. The History of German Literature from 1848-1900. *Two hours.* Professor HILDNER.

GOTHIC

1. Lectures on Phonology and Morphology and reading of the Gospels. *Two hours.* Assistant Professor EGGERT.

ENGLISH

- 1a. Outline History of English Literature. *Two hours.* Mr. HUMPHREYS.
31. American Literature. *Two hours.* Dr. GINGERICH.
4. Shakespeare. *Two hours.* Professor TATLOCK.
24. The English Bible, its literary aspects and influences. *Two hours.* Mr. HUMPHREYS.

FOR GRADUATES

5. Chaucer. *Two hours.* Professor DEMMON.
- 3a. Anglo-Saxon. *Two hours.* Professor TATLOCK.
30. Eighteenth Century Romanticism. *Two hours.* Mr. HUMPHREYS.
- 19a. Poetics. *Two hours.* Professor DEMMON.
- 13a. Introduction to the Poetry of Browning. *Two hours.* Dr. GINGERICH.

RHETORIC

- 1a. Practical Composition. *Two hours.* Mr. TOMPKINS.
- 2a. Practical Composition. *Two hours.* Assistant Professor BRUMM.
- 3a. Prose Narration. *Two hours.* Mr. TOMPKINS.
27. Teachers' Course in Grammar and College Entrance Requirements. *Two hours.* Assistant Professor RANKIN.
- 16a. Modern English Prose. *Two hours.* Assistant Professor BRUMM.
17. Diction and Usage. *Two hours.* Mr. TOMPKINS.

FOR GRADUATES

- 15a. The Theory and Practice of Argumentation. *Two hours.* Assistant Professor BRUMM.
20. Short-story Writing. *Two hours.* Assistant Professor RANKIN.
28. Studies in the Dramatic Form of Writing. *Two hours.* Assistant Professor RANKIN.

ORATORY

- 1a. Elocution. *Two hours.* Mr. IMMEL.
12. Shakespearean Reading. *Two hours.* Professor TRUEBLOOD.
- 5a. Debating. *Two hours.* Professor TRUEBLOOD.
11. Interpretative Reading. *Two hours.* Mr. IMMEL.

FINE ARTS

- 1a. General Introductory Course in the Fine Arts. *Two hours.* Professor CROSS.
- 11a. History of American Art. *Two hours.* Professor CROSS.

HISTORY

- 1b. History of England from the Reformation to the Revolution of 1688. *Two hours.* Professor CROSS.
- 7a. The History of Greece. *Two hours.* Assistant Professor MARSH.
- 8a. The History of Rome to the Founding of the Roman Empire. *Two hours.* Assistant Professor MARSH.
- 10a. The Age of the Renaissance. *Two hours.* Professor DOW.
49. Historical Studies. *Two hours.* Professor DOW.
- 39a. The History of the Ante-Bellum South. *Two hours.* Professor PHILLIPS.
43. Seminary in American Colonial History. *Two hours.* Professor PHILLIPS.

POLITICAL SCIENCE

- 1a. American Government. *Two hours.* Professor UPDYKE.
3. Municipal Government. *Two hours.* Professor UPDYKE.

POLITICAL ECONOMY

- I. INTRODUCTORY COURSE.
- 1a. Elements of Political Economy. *Two hours.* Mr. HAYES.
- II. GRADUATE AND UNDERGRADUATE COURSES.
- 1b. Elements of Economics. *Two hours.* Mr. W. H. HAMILTON.
- 3b. The Development of Modern Industrialism. *Two hours.* Mr. W. H. HAMILTON.
- 9a. Money and Banking. *Two hours.* Mr. HAYES.
- 15a. The Corporation Problem. *Two hours.* Mr. SHARFMAN.
- 6a. The Railroad Problem. *Two hours.* Mr. SHARFMAN.
4. Finance. *Two hours.* Mr. HAYES.

SOCIOLOGY

5. Human Behavior. *Two hours.* Professor PARMELEE.
6. Criminology, A Study in Social Control. *Two hours.* Professor PARMELEE.

PHILOSOPHY AND PSYCHOLOGY

I. INTRODUCTORY COURSES.

1. Introduction to Philosophy. *Two hours.* Professor LLOYD.
 7. Elementary Psychology. *Two hours.* Assistant Professor SHEPARD.
 9. Introduction to Logic. *Two hours.* Dr. SELLARS.
- #### II. FOR GRADUATES AND UNDERGRADUATES.
- 5s. Contemporary Ethical Movements. *Two hours.* Dr. SELLARS.
 - 11s. The Renewal of Philosophy in the United States after 1870. *Two hours.* Professor WENLEY.
 - 15s. Philosophy of Religion. *Two hours.* Professor WENLEY.
 - 9s. Experimental Psychology. *Two hours.* Assistant Professor SHEPARD and Dr. ADAMS.
- #### III. FOR GRADUATES PRIMARILY.
- 31c. Seminary in History of Philosophy and Ethics. *Two hours.* Professor LLOYD.
 - 31k. Seminary in Psychology. *Two hours.* Assistant Professor SHEPARD.

EDUCATION

I. HISTORICAL COURSES.

1. History of Ancient and Mediæval Education. *Two hours.* Assistant Professor JACKSON.
2. History of Education, Modern Period. *Two hours.* Assistant Professor JACKSON.
27. History of Education in America. *Two hours.* Assistant Professor JACKSON.

II. THEORETICAL COURSES.

5. Psychology of Education. *Two hours.* Assistant Professor BERRY.
6. Principles of Education. *Two hours.* Assistant Professor BREED.
20. School Hygiene. *Two hours.* Assistant Professor BERRY.
- 34a. Seminary in Educational Psychology. *Two hours.* Assistant Professor BREED.
- 40a. Psychology of the Elementary School Subjects. *Two hours.* Assistant Professor BERRY.
- 40b. Psychology of the Elementary School Subjects. *Two hours.* Assistant Professor BREED.

III. ADMINISTRATIVE COURSES.

17. Comparative School Systems. *Two hours.* Professor DAVIS.
32. Secondary Education, Advanced Course. *Two hours.* Professor DAVIS.

MATHEMATICS

80. Plane Geometry. Mr. COE.
81. Solid Geometry. Mr. GARRETSON.
82. Elementary Algebra. Mr. COE.
83. Trigonometry. *Two hours.* Mr. ESCOTT.
84. Algebra. *Two hours.* Assistant Professor FIELD.
2. Analytic Geometry. *Four hours.* Assistant Professor KARPINSKI.
86. Geometry and Algebra. *Two hours.* Professor BEMAN.
3. Calculus. *Four hours.* Professor MARKLEY.
89. Calculus. *Four or five hours.* Assistant Professor RUNNING.
51. Introduction to the Mathematical Theory of Finance, Insurance, and Statistics. *Two hours.* Mr. ESCOTT.
47. History of Mathematics. *Two hours.* Assistant Professor KARPINSKI.

FOR GRADUATES

90. Differential Equations. *Two hours.* Professor BEMAN.
91. Projective Geometry. *Two hours.* Assistant Professor FIELD.
92. Theory of Functions. *Two hours.* Professor MARKLEY.
95. Infinite Series and Products. *Two hours.* Professor FORD.
96. Harmonic Analysis. *Two hours.* Professor FORD.

ASTRONOMY

15. Modern Astronomy. *Two hours.* Professor ALBRECHT.
3. Practical Astronomy. *Two hours.* Professor ALBRECHT.
215. Physical Astronomy. *Two hours.* Professor CURTISS.
Graduate Work.

PHYSICS

- Z. Physics for Admission. Mr. RICH.
1. General Physics. *Four hours.* Professor HENDERSON.
3. Laboratory Work. This course may be elected as 3c, *three hours*, or 3b, *two hours*. Dr. MELLENCAMP and Dr. COLBY.
- FOR GRADUATES AND UNDERGRADUATES
5. Electrical Measurements. *Four hours.* Professor SMITH and Dr. COLBY.
6. Advanced Electrical Measurements. *Three hours.* Professor SMITH.
9. Direct Current Machinery. *Two hours.* Assistant Professor WILLIAMS.
10. Alternating Currents. *Two hours.* Assistant Professor WILLIAMS.
14. Electron Theory and Radioactivity. *Two hours.* Professor GUTHE.

FOR GRADUATES

- 23. Theory of Heat. *Two hours.* Professor RANDALL.
- 24. Thermodynamics (II). *Two hours.* Professor GUTHE.
- 25. Laboratory Work in Heat. *Two hours.* Professor RANDALL.
- 38. Research. Professor GUTHE.

CHEMISTRY

- 1s. Elementary Inorganic Chemistry. *Four hours.* Assistant Professor HALE and an assistant.
- 1as. Elementary Laboratory Work in Inorganic Chemistry. *Two hours.* Assistant Professor SMEATON.
- 2s. Advanced Inorganic Chemistry. *Two hours.* Assistant Professor LICHTY.
- 2as. Laboratory Work in Inorganic Chemistry. *Two hours, or four hours by special permission of the instructor.* Assistant Professor LICHTY.
- 3a. Qualitative Analysis. *Four hours.* Mr. COLE and Mr. McALPINE.
- 3b. Qualitative Analysis. *Four hours.* Mr. CARNEY.
- 5s. Beginning Quantitative Analysis. *Five hours.* Mr. CARNEY.
- 7s. Organic Chemistry. *Two hours.* Assistant Professor CONE.
- 42s. Organic Preparations. *Two to five hours.* Assistant Professor CONE and Dr. HUNTER.
- 9s. Physical Chemistry Applied to Analysis. *Two hours.* Assistant Professor SMEATON.
- 10s. Elementary Theoretical and Physical Chemistry. *Two hours.* Professor BIGELOW.
- 13s. Physical-Chemical Measurements (Laboratory). *Two, four, or six hours.* Dr. BARTELL and assistant.
- 33as. Chemical Technology of Fuel Utilization and Water Softening. See Chemical Engineering 2a, page 449.
- 35s. Technical Gas and Fuel Analysis. See Chemical Engineering 9, page 449.
- 12a. Chemistry of the Household. *Two hours.* Dr. HUBBARD.

MINERALOGY AND PETOGRAPHY

- 1. Elements of Mineralogy. *Two hours.* Professor KRAUS and assistant.
- 4. Determinative Mineralogy. *Two hours.* Assistant Professor HUNT and assistant.
- 5. Qualitative Blowpipe Methods. *Two hours.* Assistant Professor HUNT.
- 9. Lithology. *Two hours.* Assistant Professor HUNT and assistant.

3. Crystal Measurements. *Credit to be arranged.* Professor KRAUS and Assistant Professor HUNT.
8. Special Work. *Credit to be arranged.* Professor KRAUS and Assistant Professor HUNT.
Graduate Work.

GEOLOGY

21. Teachers' Course in Physiography. *Two hours.* Professor CARNEY and assistant.
23. Geographic Influences. *Two hours.* Professor CARNEY and assistant.
24. Geography of North America. *Two hours.* Professor CARNEY and assistant.

ZOOLOGY

1. Elements of Animal Biology. *Two hours.* Mr. OKKELBERG and Mr. SINK.
- 9a. Embryology of Vertebrates. *Four or eight years.* Mr. OKKELBERG.

BOTANY

FOR UNDERGRADUATES

1. General Botany. *Two hours, or half unit for entrance.* Assistant Professor HUS.

FOR UNDERGRADUATES AND GRADUATES

56. Agricultural Botany. *Four hours.* Assistant Professor HUS.
55. Algae, Liverworts, Mosses, and Ferns. *Two or four hours.* Assistant Professor KAUFFMAN.
18. Mycology and Plant Diseases. *Two or four hours.* Assistant Professor KAUFFMAN.
20. Advanced Mycology and Pathology. *Three hours.* Assistant Professor KAUFFMAN.
26. Plant Physiology. *Five hours or more per week of laboratory work, forenoons, for two hours, or ten hours work per week for four hours.* Professor POLLOCK.
57. Heredity and Evolution. *Two hours, except for students electing Agricultural Botany, who receive half credit.* Assistant Professor HUS.

FOR GRADUATES

- 42, 44. Research in Physiology, Soil Biology, and Nutrition of Fungi. *Four, six, or eight hours.* Professor POLLOCK.
46. Research in Bacterial Diseases of Plants. *Four, six, or eight hours.* Professor POLLOCK.
50. Plant Pathology. *Credit to be arranged.* Assistant Professor KAUFFMAN.
54. Research in Genetics. *Credit to be arranged.* Assistant Professor HUS.

LANDSCAPE DESIGN

- 1b. Introductory Course. *Two hours.* Assistant Professor TEALDI.
5a. Trees, Shrubs, and Flowers. *Two hours.* Assistant Professor TEALDI.

DRAWING

See Announcement of Courses on page 448.

PHYSICAL TRAINING

The work in Physical Training for women was given by Miss MARION O. WOOD. The courses for men were given by Dr. GEORGE A. MAY, Assistant Professor of Physical Training and Director of the Waterman Gymnasium for Men.

COURSES FOR WOMEN

1. General Gymnastics for Individual Improvement.
2. Dancing.
3. Basket-ball, Volley-ball, Tennis, Archery.
4. Swimming.

COURSES FOR MEN

1. General Gymnastics and Physical Training.
2. Corrective Gymnastics.
3. Treatment of Emergencies.
4. Anthropometry.
5. Special Contest Exercises.

EMBALMING AND SANITARY SCIENCE

1. Anatomy. Dr. J. H. STOKES.
2. Bacteriology. Mr. J. F. MORGAN.
3. Chemistry. Assistant Professors W. J. HALE and W. G. SMEATON and an assistant.
4. Practical Embalming. Mr. C. G. ASKIN.

DEPARTMENT OF ENGINEERING**ENGLISH**

1. Theme-Writing and Oral Exposition. *Four hours.* Mr. MARCKWARDT.
2. Theme-Writing and Oral Exposition. *Two hours.* Mr. MARCKWARDT.
3. Expository Writing. *Two hours.* Mr. MARCKWARDT.
- 8a. Scientific Reading. *Two hours.* Mr. MARCKWARDT.

GERMAN

- 1s. Beginners' Course. *Six hours.* Dr. HAUHART.
1. Beginners' Course. *Four hours.* Professor WAIT.

FRENCH

- 1s. Beginners' Course. *Six hours.* Mr. KENYON.
1. Beginners' Course. *Four hours.* Mr. HURLBURT.

POLITICAL ECONOMY

See Announcement of courses on page 441.

LAW

See Announcement of courses on page 452.

MATHEMATICS

- 1a. Trigonometry. Course 1a is equivalent to Course 83 of the Summer Session in the Department of Literature, Science, and the Arts.
1. Algebra and Analytic Geometry. *Four hours.*
Algebra. Assistant Professor FIELD.
Analytic Geometry. Assistant Professor KARPINSKI.
2. Analytic Geometry. *Four hours.* Mr. GARRETSON.
3. Calculus. *Five hours.* Mr. HOPKINS.
4. Integral Calculus and Differential Equations. *Five hours.* Assistant Professor RUNNING.

PHYSICS

- Z. Physics for Admission. Mr. RICH.
 5. Electrical Measurements. *Four hours.* Professor SMITH and Dr. COLBY.
 6. Advanced Electrical Measurements. *Four hours.* Professor SMITH.
- For other courses in Physics, see page 443, Department of Literature, Science, and the Arts.

CHEMISTRY

- 1s. Elementary Inorganic Chemistry. *Four hours.* Assistant Professor HALE and an assistant.
 - 1as. Elementary Laboratory Work in Inorganic Chemistry. *Two hours.* Assistant Professor SMEATON.
 - 3a. Qualitative Analysis. *Four hours.* Mr. COLE and Mr. MCALPINE.
 - 3b. Qualitative Analysis. *Four hours.* Mr. CARNEY.
 5. Beginning Quantitative Analysis. *Five hours.* Mr. CARNEY.
- For other courses in Chemistry, see pages —.

METALLURGY

See Chemical Engineering on page 449.

ASTRONOMY

See Announcement of courses on page 443.

MINERALOGY

See Announcement of courses on page 444.

GEOLOGY

See Announcement of courses on page 445.

DRAWING

- 4. Descriptive Geometry. *Four hours.* Mr. MILLER.
- 4a. Descriptive Geometry and Shades and Shadows. *Four hours.* Mr. EVERETT.
- 5a. Perspective and Sterotomy. *Two hours.* Mr. EVERETT.
- A. Free-Hand Drawing in Charcoal or Pencil. *Two hours.* Mr. EVERETT.
- B. Free-Hand Drawing in Pencil, Wash, or Color. *Two hours.* Mr. EVERETT.

SHOP PRACTICE

- 1s. Wood Shop and Forge Shop. *Four hours.*
Wood Shop, Mr. YEATMAN.
Forge Shop, Mr. McDONALD.
- 2s. Pattern-making and Foundry. *Four hours.*
Pattern-making, Mr. YEATMAN.
Foundry, Mr. WARREN.
- 3s. Machine Shop. *Four hours.* Mr. COEB.
- 5. Instrument-making. *Two hours.* Mr. STEVENSON.

SURVEYING

- 3a. Summer Camp-Field Work. *Eight hours.* Professor JOHNSTON, Assistant Professor ATWELL, Mr. BRODIE, Mr. BAILEY, and seven assistants.
- 4s. Use of Instruments. *Two hours.* Mr. CAREY and assistants.

ENGINEERING MECHANICS

- 1. Kinematics, Statics. *Four hours.* Professor TILDEN, Mr. MENEFEE.
- 2. Strength of Materials. *Three hours.* Assistant Professor DECKER.
- 3. Dynamics. *Three hours.* Mr. MENEFEE.
- 4. Hydromechanics. *Two hours.* Mr. LADD.

CIVIL ENGINEERING

- 21. Roofs and Bridges. *Three hours.* Assistant Professor DECKER.

MECHANICAL ENGINEERING

- 1s. Mechanism and Graphical Statics of Machines. *Four hours.* Mr. FINCH.
2. Machine Drawing. *Two hours.* Mr. GREINER.
3. Steam Engines and Other Heat Engines. *Four hours.* Mr. COPE.
5. Thermodynamics. *Three hours.* Assistant Professor EMSWILER and Mr. COPE.
6. Theory of Machine Design. *Five hours.* Mr. GREINER.
7. Steam Laboratory. *Two hours.* Assistant Professor EMSWILER and Mr. COPE.
- 8s. Steam Laboratory. *Three hours.* Assistant Professor EMSWILER.

ELECTRICAL ENGINEERING

1. Dynamo-Electric Machinery. *Four hours.* Professor BAILEY, Mr. LOVELL, and Mr. WILSON.
2. Direct Current Machinery. *Four hours.* Mr. LOVELL.
3. Alternating-Current Generators, Motors, and Transformers. *Four hours.* Professor BAILEY and Mr. WILSON.
4. Alternating-Current Motors. *Three hours.* Professor BAILEY.
5. Design of Electrical Machinery and Appliances. *Four hours.* Professor BAILEY.
7. Illumination and Photometry. *Two hours.* Mr. LATTIMER.
13. Telephones. *Four hours.* Mr. LATTIMER.
18. Research Work in Electrical Engineering. *Credit to be arranged.* Professor BAILEY and Mr. LOVELL.

CHEMICAL ENGINEERING

1. Manufacture and Properties of Iron and Steel. *Two hours.* Mr. A. E. WHITE.
- 2a. Fuels and Water Softening. *Two hours.* Professor A. H. WHITE.
8. Metallography. *Two hours.* Mr. A. E. WHITE.
9. Technical Gas and Fuel Analysis. *Two hours.* Professor A. H. WHITE.

NAVAL ARCHITECTURE AND MARINE ENGINEERING

All courses are given by Assistant Professor BRAGG.

2. Ship Calculations. *Two hours.*
8. Marine Boilers. *One hour.*
9. Marine Engines. *Three hours.*
- 17s. Drawing. *Two to eight hours.* In this class may be taken one or more of the following courses:

5. Structural Drawing. *Two hours.*
6. Ship Calculations. *Three hours.*
7. Ship Drawing and Design. *Three hours.*
10. Boiler Drawing. *Two hours.*
11. Marine Engine Drawing. *Two hours.*

ARCHITECTURE

GENERAL DESIGN.

1. Elements of Design. *Two hours.* Mr. TITCOMB.

ARCHITECTURAL DESIGN.

4. Elementary Architectural Design. *Two hours.* Mr. TITCOMB.
5. Intermediate Architectural Design. *Three hours.* Mr. TITCOMB.

CONSTRUCTION.

21. Carpentry, Materials, Framing, Details. *Two hours.* Mr. McCONKEY.

DEPARTMENT OF MEDICINE AND SURGERY

MEDICINE

1. Clinical Medicine. Professor HEWLETT.
2. Clinical Microscopy. Dr. AGNEW.

SURGERY

1. Clinical Surgery. Professor DARLING.
2. Operative Course in Surgical Technique and Operative Surgery. Professor DARLING.

OBSTETRICS AND GYNECOLOGY

OBSTETRICS.

1. Practical Obstetrics. Dr. DeWITT.
2. Obstetric Diagnosis. Dr. DeWITT.
3. Demonstration and Manikin Course. Dr. SEELEY.
4. Junior Palpation Course. Dr. SEELEY.

GYNECOLOGY.

5. Clinical Gynecologic Diagnosis. Dr. CUMMINGS.
6. Diagnostic and Operative Gynecology. Dr. CUMMINGS.

OPHTHALMOLOGY

1. Ophthalmic Surgery. Professor PARKER.
2. External Diseases of the Eye. Professor PARKER and Dr. SLOCUM.
3. Refraction. Dr. SLOCUM.

OTOLARYNGOLOGY

The work in Otolaryngology is given by Professor Canfield and Dr. Smith, and is intended for both specialists and general practitioners.

1. Clinical Demonstration.
2. Operative Surgery.
3. Functional Examination of the Ear.

DISEASES OF THE NERVOUS SYSTEM

1. Clinical Neurology. Professor CAMP.

PHYSIOLOGY

1. Laboratory Work in Physiology. Dr. COPE.

PATHOLOGY

1. Laboratory Course in Pathology. Professor WARTHIN and Dr. WELLER.
2. Course in Pathological Technique. Professor WARTHIN and Dr. WELLER.
3. Pathology of the Female Genito-Urinary Organs. Professor WARTHIN and Dr. WELLER.

PUBLIC HEALTH.

8. Graduate Course. Professor WARTHIN.

PHARMACOLOGY

1. Experimental Pharmacology. Dr. ROTH.

PHYSIOLOGICAL CHEMISTRY

1. Laboratory Work in Physiological Chemistry. Mr. DOTY.

BACTERIOLOGY

1. Laboratory Work in Bacteriology. Mr. BEHRENS.
2. Vaccines and Serum-Reactions. Dr. CUMMING.

ANATOMY

1. Laboratory Work in Human Anatomy. Dr. McCOTTER.

DEPARTMENT OF LAW

JUNE 23 TO JULY 26.

FIRST YEAR SUBJECTS

Contracts.—Williston's Cases and Anson on Contracts. *Nine hours a week.* Professor BALLANTINE.

Elementary Law and Property I.—Cooley's Blackstone and Gray's Cases on Property, Volume 1, second edition. *Nine hours a week.* Professor DRAKE.

Torts.—Burdick on Torts and Burdick's Cases (Latest Ed.) *Six hours a week.* Professor SUNDERLAND.

SECOND AND THIRD YEAR SUBJECTS

Bills and Notes.—Bunker's Text and Cases on Negotiable Instruments. *Six hours a week.* Professor BUNKER.

Constitutional Law.—McLain's Cases on Constitutional Law; Cooley's Principles of Constitutional Law. *Nine hours a week.* Professor BATES.

Damages.—Mechem and Gilbert's Cases. *Six hours a week.* Professor DRAKE.

Property III.—Gray's Cases, Vols. II and III (2nd Ed.) *Six hours a week.* Professor AIGLER.

Suretyship.—Bunker's Cases. *Six hours a week.* Professor BUNKER.

JULY 28 TO AUGUST 30.

FIRST YEAR SUBJECTS

Contracts (Completed).—*Nine hours a week.* Professor BALLANTINE.

Common Law Pleading.—Martin's Civil Procedure. Whittier's Cases on Pleading. *Nine hours a week.* Professor STONER.

Torts (Completed).—*Six hours a week.* Professor SUNDERLAND.

SECOND AND THIRD YEAR SUBJECTS

Corporations, Private.—Wilgus's Cases. *Twelve hours a week.* Professor WILGUS.

Evidence.—Wigmore's Cases. *Twelve hours a week.* Professor LANE.

Property III (Completed).—*Six hours a week.* Professor AIGLER.

Property IV.—Gray's Cases on Property. *Twelve hours a week.* Professor COCKLEY.

Sales.—Williston's Cases (2nd Ed.) *Nine hours a week.* Professor WAITE.

SCHOOL OF PHARMACY

1. Theory of Pharmacy. Dr. HUBBARD.
2. Manufacturing Pharmacy. Professor STEVENS.
3. Manufacturing and Drug Assaying. *Four hours.* Professor STEVENS.
5. Food and Drug Analysis. Dr. HUBBARD.
- 12a. Chemistry of the Household. *Two hours.* Dr. HUBBARD.

BIOLOGICAL STATION

ZOOLOGY

1. The Natural History of Vertebrate Animals. *Two hours.* Dr. ELLIS.
2. The Natural History of Invertebrate Animals, Exclusive of Insects. *Four hours.* Assistant Professor SMITH.
3. The Natural History of Birds. *Two hours.* Mr. COMPTON.
4. The Natural History of Insects. *Two hours.* Mr. WELCH.
6. Special and Research Work in Zoology. *Two, four, six, or eight hours.* Assistant Professor SMITH, Dr. ELLIS, and Mr. WELCH.

BOTANY

1. Field and Forest Botany. *Four hours.* Dr. WHITFORD.
2. Systematic Botany. *Two hours.* Assistant Professor GLEASON.
3. Ecology. *Two hours.* Assistant Professor GLEASON.
4. Individual Course, Special and Research Work. *Two, four, six, or eight hours.* Assistant Professor GLEASON.

SCHOOL OF LIBRARY METHODS

1. Cataloging.
2. Classification.
3. Reference Work.
4. Book-Binding.
5. Children's Libraries.

SUMMER SESSION OF 1914

The Announcement of the Summer Session of 1914 contains full information concerning all the courses to be given in the several Departments of the University. Copies of this Announcement may be had by addressing the Secretary of the Summer Session.

List of Graduates of 1913*

DEPARTMENT OF LITERATURE, SCIENCE, AND THE ARTS

BACHELOR OF SCIENCE

†Richards Ellison Amos	†Harold Taber Lewis
†Lewis John Armstrong	Russell Vail Lucas
†Leslie Park Barrett	I.. Coleman Ludlum
†Dwight Cullom Birch	Ralph Maitland McCormick
<i>Conferred in 1912</i>	Andrew Frederick MacFarland
†Richard F. Boonstra	George Walter Mason
Jacob Sylvester Brown	†Horace Wilson Mitchell
†Aaron Chapman Button	Maxwell John Moon
<i>Conferred in 1912</i>	Emil Jacob Munch
†Harold Edward Clark	†Frederick TenEyck Munson
<i>Conferred in 1912</i>	<i>Conferred in 1912</i>
Nellie Bridget Cooney	Nelson Allen Myll
†Linus Reed Cranmer	Louis Earl Pomeroy
†Paul Henry DeKruif	Avery DeHart Prangen
Josephine Augusta Fellows	†Karl Greene Richards
†Charles Luke Foreman	Otto Herman John Ruettinger
†Giles Morton Fritch	†Paul Victor Siggers
Carl Grover Frost	<i>Conferred in 1912</i>
William Henry Gordon	Wayne Gardner Smith
Cornelius Louis Harrington	Lee Francis Supple
Oliver Herman Heidt	†Oscar M. Unger
Lynne Arthur Hoag	William R. Vis
Frank Park Hunter	†Alfred Voigt
†Charles Reuben Keller	†William Wallace Weber
†Ezra Edwin Koebbe	Marshall Agnew Welbourn
†Ching Lin Kuan	†John Randall Welch
John George Lahr	†Edgar William White
Harry Launt	<i>Conferred in 1912</i>
†Vernon Walker LeMaster	
<i>Conferred in 1912</i>	

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* The list of Graduates contains the names of all persons on whom degrees were conferred during the year 1913. A dagger (†) indicates that the degree was conferred at some other time than Commencement.

BACHELOR OF ARTS

Florence Emma Adams	Olive Mabel Caldwell
Henry Carter Adams, Jr.	†Margaret Cameron
†Charles Edwin Albright,	†Otto C. Carpell
<i>As of the Class of 1890</i>	Harriett Carroll
Edna Marion Alfred	George Peck Caulkins
Henry Clement Allen	Stella Chalmers
†Harry Knaupp Allwardt	Howard Joseph Chambers
†Gould Arthur Andrews	†Helen Eva Chapman
LeGrande Jenks Arnold	Elizabeth Ann Clark
Hugh Day Backus	Mabel Edith Clark
†Albert Ross Bailey	†Katherine Anne Coates
†Phineas Otis Bailey	†David Harold Colcord
†Harry Jay Baker	Edward LeRoy Cole
Robert Harper Baker	Wendell Phillips Coler
Marjorie Gladys Baldwin	Willis Huntley Collar
†Vera Maybelle Barker	Esther Lillian Collins
Amy Carolyn Barnum	Helen S. Collins
†Anthony Patrick Barrett	†Raymond Weaver Colman
Irving Miles Bassett	Viona Colman
Raymond Emmet Bassett	John Kittridge Coolidge
†Viola May Becker	Ethel Fern Coons
Julius Lanson Beers	†Gertrude Venetta Cope
Joseph John Bell	Charles Raymond Criswell
Fred James Benson	Louis Frederick Crosby
Madeline Louise Bird	Lucile Elizabeth Culbertson
Leland Stanford Bisbee	Matilda Mary Currie
Frances Adaline Bishop	George Lyman Curtis
†Alice Persis Bixby	Fredericka Marie Daniel
William Franklin Black	Esther Ellen Darrow
†Frank Thaddeus Bleya	†William Telfair Daugherty
Gladys Mable Boise	Cora Ruth Davis
Lucy Judith Bonino	Marjorie Davis
Erwin Parsons Bosworth	Edward Harris Decker,
†Sidney DeLos Boyden	<i>As of the Class of 1897.</i>
<i>Conferred in 1912</i>	Mercedes de Goenaga
Mabel May Bradshaw	Norma Louise de Guise
Nora Regina Braun	Ralph J. DeLand
Mary Ruth Bridge	†Jay Harold Den Herder
Lillian Wells Brown	Donald Goodrich Denison
†Josephine Van Dyke Brownson.	Howard Vance Devree
Leo Lewis Bruder	Robert Chauncey Dexter
Raymond Porter Buck	Harry Reginald Dey
Zeltah Pauline Buck	Selden Stratton Dickinson
Ruth Burdsal	Naomi Dora Dietz
Elizabeth Maria Burns	Beulah Elizabeth Dillingham
Helen Marie Butler	Jerome Allen Ditchy

Pearl Annetta Dolf
 Raymond Edward Doty
 Alice Ruth Douglas
 Harold Francis Douglas
 Thomas James Doyle
 Arend Van der Veen Dubee
 James Francis Dubuar
 Jay Dunne
 Leo Leon Eddy
 †George Palmer Edmonds
 William Henry Egly
 †Carleton Emerson Ehle
 George Marion Ehlers
 Edel Veronica Ehrhorn
 Mary Florence Ensfield
 †Eleanor Ettelson
 Bernard Bowman Fallon
 †Robert Pattison Felgar
 Nell Burton Felver
 Ray Leigh Fish
 Charles Eben Fisher
 Howard Willis Ford
 Marshall Bean Ford
 Christine Elizabeth Foster
 †Joseph Narcisse Fouchard
 †Fred Barnhart Foulk
 Don Irving Frace
 Sara Marguerite Franck
 Carl Kimball Friedman,

As of the Class of 1891

Jennie Gertrude Fuerstenau
 Carrie Elizabeth Fyffe
 †Ina Virginia Gabriel
 Charles Percy Garwood
 Erna Katherine George
 †John Philip Goldsberry
 †Harold Elijah Goodenow
 †David Spencer Goodyear, Jr.

Conferred in 1912

Florence Gottdiener
 †Mae Elizabeth Grandon
 Reuben R. Green
 Daisy Greenacre
 Agnes Elizabeth Greene
 Morley Griswold
 Mildred Beulah Guilford
 Carroll Barse Haff
 †Richard Alvord Hamilton

John Valentine Hammersmith
 Gladys Clayton Hammond
 John Perry Hanna
 Juliet Thorne Hart
 Ray Cyrus Harter
 †Lorin Heacock
 †Sylvester Thomas Healy
 Helen Marguerite Henning
 John Emory Henton
 Joseph Lincoln Hickey
 Walter Cheney Hill
 Hellen Elisabeth Hilliker
 Olivia Clare Hoermann
 Lilian Louise Hogan
 Alma Hollinger
 †Clarence Ross Holmes
 Mildred Emily Holznagle
 †John Jacob Hornberger

Conferred in 1912

†Lloyd Gibson Hornby
 †Flora Esther Horr
 †Maurice Elmer Houck
 †Morris Elmer Houser
Conferred in 1912
 Selma Hoyseth
 Clark Leonard Hull
 Grace Darling Hull
 †Ervin Richard Hurst
 Georgia Gertrude Hyatt
 Clara Grover Inglis
 Mary Allen Jackman
 Edna Grace Jackson
 †Emra DeWitt Jaqua, Jr.
 Osee Helena Jewell
 Charles Richard Johnson
 Charles Samuel Johnson
 Edwin Ray Johnson
 William McKeehan Johnston
 Katherine Kelly
 Frederick Johnston Kennedy
 †John Edward Kennedy
 †Mary Agnes Kennedy
Conferred in 1912
 Herbert Francis Kenny
 William George Kerr
 †Clara Ellen Kervin
 Lillian Ellen Kilby
 Eda Laura King

Helen Margaret Kinney
 Florence Aurora Klinkenberg
 †Herbert Gustav Knoch
 Mildred Kolb
 Lilian May Kuhn
 Max Paul Anton Kuhr
 Newton Lamb
 Paul Thomas Landis
 Eben Elwood Lane
 Robert Porter Lane
 Lorenzo Brown Lapsley
 Dorothy Laura Larkins
 †John De LaRue
 Wanda Minnie Laubengayer
 John Funderburg Lauver
 James Monroe Leach
 Norine Veronica Leary
 John Marvin LeCato
 †Harry Daniel Lee
 Clarence John Leonard
 Otilia Rose Leuchtweis
 Olive Frances Leverett
 Alta Jennie Lich
 Hazel Grace Littlefield
 Henry Nelson Loud

As of the Class of 1872

†Isaac Lowenburg
 Ida Charlotte Lucht
 Vera Sophia Lutje
 Marigold Isabelle Lynch
 †Howard Bruce McAllister
 †Hugh Albert McAllister
 Katharine Luella Macaulay
 Wallace Webb McCall
 Jean Helen McCredie
 Edward Wills McFarland
 Stanley Dickinson McGraw

As of the Class of 1892

Catherine Hostetter Mackay
 Flora Isabel MacKenzie
 Bessie Lucile McLouth
 Julian Meredith MacMillan
 Russell Arthur McNair
 William L'Estrange Mahon, Jr.
 Winifred Balch Mahon
 Georgia Henrietta Maier
 William Henne Maier
 Edwin Butterworth Mains
 †Augustus Lester Mancourt

Rachel Marietta Markham
 Elsa Marie Maroney
 Helen Louise Martin
 †Theodore Snow Mead
 Leland Mechem
 William Ray Melton
 Paul Drake Merrifield
 †Lionel Nordyke Metzger
 †Fred Arnold Middlebush
 Mary Lincoln Miller
 Claude Knight Milligan
 †Harry Darwin Mills
 †John Rice Miner
 Mono Mitobe
 Austin Edward Moden
 †Karl John Mohr
 Gertrude Sarah Moore
 †Blair Moorhead
 Joel Royden Morrison
 †Mark Henry Mothersill
 †Edgar Ansel Mowrer
 Henry William Muller
 Louis Healy Murphy
 Grace Irene Murphy
 John Henry Muyskens
 Libbie Grace Neimark
 Laura Helen Nelson
 Frances Elizabeth Nettleton
 Florence Edna Newell
 Mary Louise Newkirk
 †Nels Ole Nicholson
 Clyde Wallace Nicolson
 Grace Marie Northrup
 Robert Lev Novy
 Bertha Irene Noyes
 Harold LeGrand Nutting
 Horace Holmes Ohlmacher
 Robert Allen Oren
 Mildred Mary Orr
 Lura May Overholt
 Mary Palmer
 Agnes Purcell Parks
 Marguerite Marie Parsons
 Adeline Collins Peers
 Gertrude Ain Peet
 Viola Hazel Pell
 Claudius Grant Pendill
 John Carroll Peterson
 Alice Pettus

†William Ford Pipes
 †Robert Carl Porter
 Ruth Coatsworth Post
 John Lawrence Primrose
 Clement Patrick Quinn
 Theophile Raphael
 Luella May Rayer
 Allen Martin Reed
 Anna Gertrude Reed
 †John Jacob Reighard
 Dexter Keith Reinhart
 †Frank Adolph Reitz
 †Roland Edward Reynolds
 †Edward Richard Rice
 Elmer Riebel
 George Russell Rinehart
 Edith Pearl Rings
 Gladys Milicent Roberts
 Maud Edith Robertson
 Loren Thorne Robinson
 Mabel Estelle Rose
 Edwin J. Rosenberg
 Benjamin Franklin Rosenthal, Jr.
 Walter Allen Roth
 Winnifred Anderson Rowe
 Frances Rachel Russell
 Harry Earle Russell
 †Mary Josephine Ruthrauff
 Genevieve Frances Ryan
 †Edward Herbert Saier
 Elizabeth Margaret Sargent
 Arthur Forbes Schaefer
 Carl Gustave Schoeffel
 Norton Schuyler
 †Harold Philippi Scott
 Lillian Alice Scott
 Marguerite Cadwell Scott
 Clair Ketcham Searles
 Marjorie Harriet Sebring
 Alice Justine Seeber
 Ray Appleton Sellman
 Abraham Joseph Seltzer
 Florence Marie Senn
 Ruby Lucile Severance
 Jesse Yetter Shambach
 †Eva Alma Sharpe
 Elaine Beatrice Shields
 Martin Joseph Shugrue
 Ih Hsiian Si

Elizabeth Skillen
 Raymond Bernard Slack
 Mary Slater
 †Alonzo Covert Smith
 Arthur Reve Smith
 Emerson Reid Smith
 Herschel C. Smith
 Lelia Pearl Smith
 †Robert Ingersoll Snajdr
 †Frank Howard Sooy
 Rolfe Chapin Spinning
 Henry Spring
 †Waitstill Hastings Squire,
As of February 7, 1913
 Edith Mildred Stacey
 Walter Paul Staebler
 †James Geddes Staley
 Maqueston Stanley
 †Alice Ramsey Stark,
Conferred in 1912
 Russell Alger Stevenson
 Florence Oberlin Stinchcomb
 Harney Bivins Stover
 Gladys Irene Stowell
 †Chester Fowle Straight
 Amanda Sophia Strom
 †Charles Leslie Suiter
 Florence Wilson Swinton
 Maude Evelyn Talbott
 †John Baker Taylor
 Marten Ten Hoor
 Edwin Rice Thurston
 Stanley Irving Tice
 Kinsaku Tonouchi
 Delos Allan Towle, Jr.
 John Willard Towler
 John Hurlburt Townley
 Arcola Trengove
 Donald Kiteley Tressler
 William Campbell Tribble
 Edward Henry Troy, M.D.,
As of the Class of 1894
 Mary Catherine Tunison
 †Frances Belle Bailey Turner
 Audrey Philleo Updike
 †Miles Ellsworth Valentine
 †Carnot King Valiton
 Lewis George Vander Velde
 Warren Taylor Vaughan

†Michael Lewis Vohland	Mae Aileen White
Roy Ellis Waite	Anne Charlotte Wiggins
Raymond Monroe Waltz	Florence Kissick Wilson
Marie Virginia Wanzeck	Howard William Wilson
†Elde Hulett Ward	Laura Norton Wilson
<i>Conferred in 1912</i>	
Sarah Elizabeth Ware	William Thomas Wilson
†Telephus Mahlon Weierbach	Ernest Mark Wisdom
Herman John Weigand	†Otto Giles Wismer
†Amos Haller Weigel	Louis Frederick Wochholz
Elizabeth Weisman	May Elva Woodhams
Laura Elizabeth Wendel	Ethel Mae Wright
†Orrin John Wenzel	George Green Wright
William Walter Wheatley	Marguerite Meade Wurzburg
Helen Knowlton Whedon	Charles Edward Wyman
†Ethel Arleigh Wheeler	†Tsutomu Yamada
†George Irving White	Jacob Selig Yellen 403-454

DEPARTMENT OF ENGINEERING

BACHELOR OF SCIENCE

IN ENGINEERING

Maurice Darius Bensley	Frederick William Graupner
†Stanley Evans Borleske	†Clarence William Hannon,
†George Albert Buchanan	<i>Conferred in 1912</i>
†Aubrey Everett Burnham,	Morton Rocha Hunter
<i>Conferred in 1912</i>	Dwight Hartman Muckley
Jesse Thomas Caldwell	†Godfrey Strelinger
†Everett Cavanagh	Leslie Osgood Waite
Ward Follett Davidson	†Edward Palmer Wilgus
Harlan Armstrong Depew	Harold Barclay Williamson
William Michael FitzGerald	17

BACHELOR OF ARCHITECTURAL ENGINEERING

Don Milton Daron	Harold Marsh Penney	2
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BACHELOR OF ARCHITECTURE

Herbert Leslie Burgess	John Carman Thornton	
Fred Benjamin Klein	Roger LeBaron Waring	
†Joseph Edward Rosatti	Harry Lemon White	6

BACHELOR OF MARINE ENGINEERING

Clarence Oliver Clow	Harold Balmer Pickering	
Herbert Spencer Hewitt	Theodore Oakland Warford	
Clair Goodyear Hoover	Ray Belmont Whitman	7
William Macgregor Mills		

BACHELOR OF CHEMICAL ENGINEERING

Alfred Taylor Braden	Owen Harley Mitchell
Louis Dickinson Brown	Leon Jenkins Paddock
†Pao Hua Chang	Henry Abraham Rothchild
Glenn Ernest Cullen	Royal Lyman Sessions, A.B.
Herbert John Cutler	Clarence Gardner Smith
Edward Adrian De Windt	Clifford Lincoln Snyder
Clinton Marsh Edwards	Park Noble Sutton
Philip Kingsbury Fletcher	Merl Nelson Taber
Louis Altman Goldenberg	Robert Hamilton Tennant
†Ebenezer Oliver Grosvenor	Earl Winfield Tucker
Arthur Kline Hart	Edward Willson Upham
Frank Devillow Haskins	Adelbert Leo Vandenburg
Percy James Hubbard	Rutherford Van Vliet
Stanley Hughes	†Thomas Howard Wickenden
Harold William Hunt	Carl Kingsley Wirth
Raymond Edward Lauer	†Perry Chan Wong
John Lansford McCloud	

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BACHELOR OF ELECTRICAL ENGINEERING

Russell Eugene Anderson	Erwin Alton Lockwood
Roscoe Herman Baker	Matthew Gilmour McIver,
Charles Wesley Bird	B.S., <i>Davidson College</i>
James Ben Boulton	Benjamin Franklin Morningstar
George Everett Brown	George Henry Norris
Richard Carman Combes	Lester Fremont Olson
†John Alfred Driy	Allen Mason Perry
Carl William Fischer	†Arthur Christian Rissberger
George Lundy Glasgow	†John Henry Schumann
Roscoe Conklin Hain	John Charles Sivers
Harold Gifford Harvey	Valentine Fisher Spring
Herbert Roy Hosner	Otto Frederick Stuefer
Clifford Paul Jaedecke	†George Alfred Taylor
†Robert Thrift Kendall	William Howard Turpin
Royce Gerald Kloeffler	Arthur William Uhl
†Irving Eugene Lattimer	Charles Henry Vial
†Maurice Abram Lebensburger	Almadus De Grasse Wilkinson

BACHELOR OF MECHANICAL ENGINEERING

Elton John Bennett	Arthur Louis Ellis
Chester Walton Bigelow	William McKay Ferguson
James Timothy Clune	†Walter Frederic William Freund
Webster David Corlett	Jaswant Rai Gandhi
Hem Chandra Das Gupta	John Henry Gillooly
Rodney Lamey De Lange	James Edwin Hancock

Emory Reid Hartsig
 Kent Converse Haven
 Theodore Charles Heinecke
 Kirke Keachie Hoagg
 William Leslie Holt
 Walter Scott Hopkin
 Louis Henry Hosbein, Jr.
 Eric Francis Hyde
 Charles Joseph Kessler,
Conferred in 1912
 Ram Kishan Khosla
 Roy Brooks Lapp
 Edward Tuthill Lazear
 †Bryce Lewis
 †Edwin Robert Little
 †Frederick William Lucht, Jr.
 William Winebiddle McWilliams
 Clarence Verne Martin
 †George Justin Monfort
 George Edwin Moore
 Erwin James Otis
 Harry William Pabst

†Donald Stanton Patterson
 Norman Hosmer Preble
 Erle Trowbridge Putnam
 Joseph Thomas Reader
 John Warren Rihcardson
 Carl William Sanzi
 †Saul Saulson
 William Theodore Schepeler
 †Raymond George Schaffner
 Francis Tolbert Schreiner
 †Carl Edward Seel
 Allen Firman Sherzer
 Carl Hanson Smith
 †Dean Louis Smith
 †Frederick William Spangler
 Pablo Alfredo Suess
 †Michael Terry
 †Clayton Charles Thomas
 †Stanley Roof Thomas
 Hugh Hammond Thrall
 Harold Norman Todt
 Herbert Edmund Walsh
 Carl Edward Wolfstyn

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BACHELOR OF CIVIL ENGINEERING

Leon Everette Abell
 Nathan Thomas Ashkins
 Don William Bingham
 †Louis Bleich
 †Peter Edward Brender
 George Franklin Brown
 Frank Marvin Burr
 Clarence Winfield Christen
 Mortimer Addison Clark
 Jacob Leslie Crane, Jr.
 †M. Jay DePuy,
As of the Class of 1909
 †George Lucas Dressler,
As of the Class of 1910
 Walter Rhodes Drury
 Erik August Eriksen
 Harry Bailey Fenton
 Lyman Russell Flook
 †James Wightman Follin
 Frank Cornelius Gibbs
 William Charles Giffels
 †Earle Pierce Gray
 William Arthur Grove

†Helen Isabel Hamilton
 Theron Abbott Hartung
 Laurence Scofield Holmboe
 †Ira Thomas Hook
 Walter John Howard
 Edward Murray Howell
 †Louis Gilbert Kepner
 Glenn Earle Killins
 John Jacob Krauss
 Arthur Henry Kuhn
 Frank Gardner Legg
 Frank Joseph Lemper
 Harold Gilbert McGee
 Thomas Francis McGivney
 Robert Raynolds McMath
 †Saturnino Martinez
 Edward Carl Meyer
 Stanley Thompson Mills
 †Marcelino José Paz
 Charles Logan Penny
 Bernard Prichard
 Walter Theodore Schuett

Norman Kirkwood Sheppard
 †Frederick Robert Sheridan
 Jacob Birk Spiegel
 Roland Henry Stock
 Russel E. Takken
 Maxwell Cleveland Tobias
 Stephen Riggs Truesdell

Jeptha A. Wade, A.B.,
Olivet College
 Frank Alanson Walton
 Frank Lloyd Weaver
 Charles Mallory Whelan
 †Noel Bernhart Wilkens
 Chester Owen Wisler

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BACHELOR OF SCIENCE

IN MECHANICAL ENGINEERING

Clyde Arthur Kindig,
As of the Class of 1908

Milton Hiram Rix,
As to the Class of 1902 2

BACHELOR OF SCIENCE

IN CIVIL ENGINEERING

Willard Matthew Clapp,
As of the Class of 1884

Floyd Odell Pease,
As of the Class of 1902 3-215

†John Ashley Ferguson,
As of the Class of 1905

DEPARTMENT OF MEDICINE AND SURGERY

DOCTOR OF MEDICINE

Gordon Henry Bahlman, A.B.
 Richard F. Boonstra
 Frederick Joseph Burt
 Gordon McCall Clark, B.S.
 Frederick Lawton Conklin
 Daune Wesley Crankshaw, B.S.
 Warren Ellsworth Forsythe,
 B.S., *Oregon Agricultural Col-
 lege, Ph.C.*

Joe Funderburgh, A. B.

†Parker Blair Gamble

†Floyd Daniels Gillis,

Conferred in 1912

Irving Waterloo Greene, A.B.

Charles Abram Groomes

Alpheus Tisdale Hafford

John Harold Hay, B.S.

Charles Stuart Kennedy, B.S.

William Raymond McClure, A.B.

Crawford Ward McCormick, B.S.

John Howard McEwan, B.S.

Reginald William McGeoch, B.S.
 Malcolm Yeaman Marshall, A.B.

Lloyd Melville Otis

†Homer Atkinson Ramsdell

Glenn Dewey Ransom, A.B.

Heinrich Reye, A.B.

Jamie Winston Rogers, B.S.

Frank Eugene Sayers, B.S.

Henry Aloysius Schlink, B.S.

Robert Wilson Selby, A.B.

Johannes Siveke, A.B.

Milton Case Smith

Samuel McCoy Sproat

Walter McCreary Taylor, B.S.

Leonard Waterman, B.S.

Paul Gerhart Weisman, B.S.

Carl Vernon Weller, A.B.

Jacob Sterling Wendel, A.B.

Herbert Wiggins

Frank Norman Wilson, B.S.

Carleton Ira Wood, A.B. 39

DEPARTMENT OF LAW

BACHELOR OF LAWS

- | | |
|-------------------------------------|----------------------------------|
| †Waldo Mack Abbot | James Cleary |
| Raymond Julian Alneer | Robert William Clewell |
| James Arthur Andrus | Neuman Andrew Cobb |
| Clarence Llewellyn Ashton | †David Hirsch Cohn |
| Charles Henry Avery, A.B., | †Wheaton Dudley Cole, |
| <i>Carroll College</i> | <i>As of the Class of 1912.</i> |
| Mason Albert Bailey | Victor Tuttle Conklin, A.B., |
| †Ross Herbert Baumunk, | James Raymond Conley |
| <i>Conferred in 1912</i> | †William Michael Connelly |
| Harry Kostamo Bay | †Raymond Driscoll Cooper, |
| Joseph Newton Beardslee | <i>Conferred in 1912</i> |
| Robert Gortner Beck | George Washington Cox |
| Vinton Arthur Bennehoff, Ph.B., | Louis Frederick Crosby |
| <i>Heidelberg University</i> | †Edward Daskam |
| †Ernest Augustus Bergsten | †Thomas Jefferson Davis, |
| Walter Thomas Bie | <i>Conferred in 1912</i> |
| Dion Scott Birney, A.B. | William George Desmond, A.B., |
| Solomon Blumrosen, A.B. | <i>Geneva College</i> |
| Allan Rust Black | Abner Dow Dilley |
| Raymond Ezra Bostick | John Loucks Dillinger |
| Ernest Marcellus Botkin | Nugent Dodds |
| †Charles Allen Bowman | Edwin John Donahue |
| Charles Wesley Bradrick | Dennis Francis Donovan |
| Francis James Brennen | †James Donovan, Jr. |
| †Clarence Addison Brimmer | Glen Vernon Farnham |
| Albert Washington Brobst | Morris Feldstein |
| Arthur Victor Brown | Samuel Homer Ferguson |
| †Joseph Earl Brown | David Ehren Field |
| Edward Bracy Buchanan | Floyd Critchfield Fluent |
| Howard Wesley Bunston, | Joseph Anthony Frankowski |
| B. Litt., <i>Ohio Northern Uni-</i> | Glenwood Charles Fuller |
| <i>versity</i> | Duncan Gardner |
| †Allen Homer Burket | Thomas Edward Gilbert |
| Robert Eckels Burnside | †Wilbur Gladstone Gilbert |
| Eugene Reynolds Campbell, A.B. | †Arthur Luther Gilliom |
| Warren Shaw Carter, B.S., | Robert Harvey Gillmore |
| <i>Dartmouth College</i> | Albert Gillies Goetz |
| Ernest Monroe Causey, A.B., | Laurence Edward Gordon |
| <i>DePauw University</i> | Leslie Everts Greene |
| Jackson Burton Chase | Leonard John Gringhuis |
| †Melville Weston Clark, | †Manfred Stephen Gross |
| <i>Conferred in 1912</i> | †Matthew Emerson Haggerty, |
| Romaine Clark | A.B., <i>Bucknell University</i> |
| Benjamin Clarke | Charles Walter Healy |

- †Neal Mansfield Hebing
 Samuel Isaac Herschman
 Robert Adolph Hess
 Roy Carl Hicks
 Hunt Coleman Hill
 William Timothy Hoffman
 John Hopkins
 †Adair John Hotchkiss,
 Conferred in 1912
 †Harlow Hurley
 Glenn Allen Irvin
 Gordon Fravel Jacques
 Glenn Dunn Kelly
 Frank J. Kessel
 Winthrop Welles Ketcham
 Donald Selden Kiskadden
 †John Robert Kistner
 Clarence David Knight
 John Benjamin Carter Knight
 William Henry Kuhr, A.B.
 Ewart Bruce Laing, A.B.
 Thomas Wunibald Lanigan, A.B.,
 Creighton University
 Abraham Lincoln Lapin
 Herbert Moses Lautmann
 Thomas Bert Lee
 James LeGro
 Carl Adolph Lehman
 Charles Elbert Lewis, A.B.
 Fred Moore Lewis, A.B.,
 Maryville College
 John Barden Lewis
 Clifford Boles Longley
 Allen Guy Ludington
 John Traugott Lungerhausen
 James Austin Lyons
 †Vere Lorraine McCarthy
 George Elmer McConley, Jr.
 James Lee McDowell
 John Shuck McElroy, Jr., A.M.,
 Central University
 James Wagner Mackey
 Robert Frederick McKinsty,
 B.S., *Fremont College*
 Daniel Thomas Malloy
 †Victor Leland Mansfield
 †Karl Bowdish Matthews
 William Frederick Maurer
 Robert Lee Mayall
 Myrick Day Mead
 †Edwin Joseph Mercer
 Joseph Roy Mercer, A.B.,
 Westminster College
 Max Merrell
 Walter Henry Meyer
 Selden Spencer Miner,
 As of the Class of 1878
 Samuel Biddle Mitchell, B.S.,
 Ohio Northern University
 Theodore Fuller Monroe
 †Duane Hopping Mosier
 †Francis Marion Murphy
 Harry Folsom Neal,
 A.B., *University of Illinois*
 Peter Emanuel Nelson, Ph.B.,
 Westminster College
 Walter Peter Nelson
 †Arthur Stanley Newhall
 †Albert William Norcop,
 Conferred in 1912
 Walter Joseph Nourrie, A.B.,
 St. Viators College
 Robert Nash Ogden, Jr., A.B.
 Arthur Fernando Otto
 James Nathan Parsons,
 As to the Class of 1912
 †John Howard Payne
 Conferred in 1912
 Harold Frink Pelham, A.B.
 †Emil Emanuel Penzel
 Thomas Robert Powell
 Franklin Brown Powers, A.B.
 †Charles Shugart Pryor
 Leo Paul Rabaut, A.B.,
 Detroit College
 †Clyde Raymond Randel
 Thomas Read, Jr.
 Norman Washington Reed
 Paul Reighard, A.B.
 Clare Arthur Retan
 Carl Howard Reynolds
 Phineas Rosenberg
 Darce Fields Rumsey
 Andrew Henry Sambor
 John William Schnellbacher
 †Inman Sealby
 Abraham Joseph Seltzer
 Kent Wilford Shartel

Frank Eugene Shaw	George Campbell Thomson
William John Shaw	†Volney Jean Tidball,
Frederick Ross Shearer	<i>As of the Class of 1908</i>
Charles Homer Shryock	†Patrick Henry Walsh
Irving Eugene Shutts	Loren Lee Walton
Richard James Simmons, A.B.	†Thomas Edward Webber, Jr.
Allen Thornton Smith	†George Fitch Wells,
Ora Lynn Smith	<i>As of the Class of 1895</i>
Fred Odin Smoyer	Merle Frazier Wells
†Harold Dale Souter, A.B.	Elmer C. Wesner, B.S.,
Maurice Sugar	<i>Valparaiso University</i>
Calvin Lawrence Sweek	†Euril Francis Wharton
Alger Raymond Syme	David Emerson Williams
John Arthur Syverson	Vern George Wohlheter, B. S.,
Raymond Stickney Taylor	<i>South Dakota State College</i>
Julian Terrett	Charles Welty Wolf
Harold Smith Thomas, B.S.,	†Edwin Michael Yerger
<i>Coe College</i>	†Guy Barco Zewadski
†Donald Murl Thomson	Charles Christian Zweigart 191

JURIS DOCTOR

Peter Balkema, A.B.,	Ambrose Mathew Johnston, A.B.,
<i>Buena Vista College</i>	<i>Baker University</i>
George Samuel Burgess, A.B.	Joseph Johnston Kennedy, B.S.,
John Michael Butler, A.B.,	<i>Muskingum College</i>
<i>Illinois College</i>	Wilson Waddingham Mills,
Edmund Bigelow Chaffee, A.B.	Ph.B., <i>Yale University</i>
†Howard Frederic Cline, A.B.,	Samuel Henry Morris, A.B.
<i>University of South Dakota</i>	†Frank Alfonso Reid, A.B.,
George Armstrong Cram, A.B.	<i>Roanoke College, A.B., Oxford</i>
Sidney Emerson Doyle, A.B.,	<i>University</i>
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<i>versity of Detroit</i>	Lewis William Schroeder, A.B.
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Dorothy Elizabeth Adams	96	Detroit
Fred Magee Adams		Jackson
George Edward Adams	50	Buchanan
John Quincy Adams	31	Columbia City, Ind.
Olin V. Adams		Ann Arbor
Pauline Owen Adams	10	Negaunee
Theodore Wright Adams		Ann Arbor
Walter Benedict Adams	58	Jackson
Walter Crawford Adams, m	92	Lodi, Cal.
William Theodore Adams		Detroit
George Chandler Adie		Barre, Vt.
Calvin Bennett Ainsworth	53	Grand Rapids
Fred Haffly Akers	90	Altoona, Pa.
Arthur Hubert Alaric		Bay City
Hazel Dodge Albano	104	Chesaning
Harry Glen Alcox		Charlevoix
Norma Aleck	93	Camden, N. J.
Leslie Lewis Alexander	30	Detroit
Robert Moffat Allan		Detroit
Arthur Darling Allen		Savannah, Ga.
Faye Wilkins Allen	53	Detroit
Howard Edward Allen		Lorain, Ohio
Walter Owen Allen	30	Warsaw, Ind.
William Irving Allen	89	Grand Rapids
Hugh Guthrie Allerton, l	90	Ann Arbor

* The figures following the names indicate the number of hours of credit earned by candidates for a degree prior to the beginning of the current academic year, 1913-1914, or credited to them on advanced standing. By an hour of work is meant the equivalent of one exercise a week for one semester. The letter S indicates that the student is pursuing miscellaneous studies without being registered as a candidate for a degree. A dagger (†) preceding a student's name indicates that he also pursued studies, for the whole or part of the year, in some other Department of the University, indicated by an italic letter following the name, to-wit: e, Department of Engineering; ea, Department of Architecture; m, Department of Medicine and Surgery; l, Department of Law; p, School of Pharmacy; h, Homoeopathic Medical College; d, College of Dental Surgery; g, Graduate Department. The letter following the name (without the dagger) indicates that the student is pursuing a combined course, leading to a degree in each of the two Departments.

Edwin David Allmendinger	26	<i>Corunna</i>
Ernest John Allmendinger	69	<i>Ann Arbor</i>
Walter Hosking Allmendinger	81	<i>Corunna</i>
Ada Allwardt	32	<i>Battle Creek</i>
Eunice Belle Alton	23	<i>Detroit</i>
Yancey Roberts Altscheler		<i>Louisville, Ky.</i>
José Alum	60	<i>Arecibo, P. R.</i>
Flora Bennett Ames	61	<i>Eau Claire, Wis.</i>
Arthur Lewis Amolsch, <i>m</i>	60	<i>Laurium</i>
Tony Erhard Amtsbuechler	30	<i>Traverse City</i>
Einer Bjarne Andersen	30	<i>Chicago, Ill.</i>
Allyn Taber Anderson	26	<i>Wilmette, Ill.</i>
Carl Adrian Anderson	32	<i>Ironwood</i>
Charles Edward Anderson	30	<i>Ironwood</i>
Charles May Newman Anderson, <i>m</i>	63	<i>Nespecke, Idaho</i>
Charles William Anderson	18	<i>Norway</i>
George Robert Anderson		<i>Cassopolis</i>
George William Anderson	60	<i>Grand Haven</i>
John Edward Anderson		<i>Ironwood</i>
Julia Sweet Anderson	94	<i>Denver, Colo.</i>
Ray Seward Anderson	S	<i>Ann Arbor</i>
Simeon Duval Anderson		<i>Geneseo, Ill.</i>
Winifred Lyster Anderson	90	<i>Grosse Ile</i>
Horace Justin Andrews	60	<i>Ann Arbor</i>
Louis Charles Andrews		<i>Ann Arbor</i>
Claire Kenyon Andrus		<i>Bolivar, N. Y.</i>
James Burrill Angell, 2nd	30	<i>Detroit</i>
Emil Anneke		<i>Bay City</i>
Evangeline Grace Anschutz	98	<i>Saginaw</i>
Benjamin Bennett Anthony	90	<i>Wakefield, Mass.</i>
Elsa Wilhelmina Apfel	30	<i>Ann Arbor</i>
Sara Lenore Archibald	42	<i>Morocco, Ind.</i>
Louis Aubrey Arentz		<i>Rochester, N. Y.</i>
Floyd Elmer Armstrong	92	<i>Gladwin</i>
Franklin George Armstrong	25	<i>Detroit</i>
Jeannette Armstrong		<i>Ann Arbor</i>
Effie Elisabeth Arnold, <i>m</i>	87	<i>Detroit</i>
Levon Aaron Arozian		<i>Detroit</i>
Elizabeth Sessions Arthur		<i>Detroit</i>
†Samuel Asersohn, <i>p</i>		<i>Bay City</i>
Charles Chase Ashbaugh	30	<i>Detroit</i>
John Charles Askam	26	<i>Findlay, O.</i>
John Fleming Atkins		<i>Keenan, W. Va.</i>
Frank Harlow Atkinson	104	<i>Saginaw</i>
Thomas Edgar Atkinson		<i>Toledo, O.</i>
Earle Dickinson Atwater	30	<i>Shelby</i>
Wayne Ives Atwater	95	<i>Shelby</i>
†Charles William Attwood, <i>ea</i>		<i>Conneaut, O.</i>
Nellie Louise Atwood	100	<i>Grand Rapids</i>

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Stanley Roy Augspurger	30	Dayton, O.
Glenn Hoon Auld	39	Plankinton, S. Dak.
Anna Katherine Aumer	50	Ann Arbor
Edith Austin	S	Detroit
Doane Lathrop Avery	60	Ann Arbor
James Walker Avery	62	Ann Arbor
Louise Mae Avery		Detroit
Lyda Aye	99	Beaver Falls, Pa.
Floyd Willard Ayres		Farwell
Henry Lee Ayres	26	Indianapolis, Ind.
Grace Squire Babbitt	30	Ann Arbor
Grace Elizabeth Babcock	95	Oak Park, Ill.
Robert Weston Babcock	48	Chicago, Ill.
Walter Frederick Bach		Sebewaing
Mildred Avery Bachers	30	Ann Arbor
Edson Goit Bachman		Three Oaks
Elsie Lois Backus		Ann Arbor
Donald Kay Bacon	30	Saint Paul, Minn.
Francis Adolph Bade	53	Goshen, Ind.
Carl Egbert Badgley		Dunkirk, N. Y.
Cornelius George Baer	30	Minden City
Felix Saenger Baer	38	Chicago, Ill.
Cyril Edmond Bailey		Paw Paw
George Percival Bailey	4	Erie, Pa.
Katharine Evelyn Bailey		Leslie
Marion Virgil Bailey		Sidney, O.
Edwin Frederick Baker		Detroit
Gerald Vern Baker	28	Union City
Helen Marie Baker	18	Detroit
Homer LeRoy Baker		Shenandoah, Ia.
Roy John Baker		Mount Morris, Ill.
William John Balgooyen	30	Grand Haven
Lloyd R. Ross Ball	30	Hawarden, Ia.
Grace Sarah Ballantine		Battle Creek
David Raymond Ballentine	26	Detroit
Ruth Gladys Balsam	30	Filer City
Huldah Bancroft	62	Ann Arbor
Earl Ford Bankey		Toledo, O.
Richard Louis Barie		Owosso
Albert Raymond Barker	12	Detroit
John Butler Barker	24	Minneapolis, Minn.
Julia Neal Barksdale	26	Portsmouth, Va.
Alice Maude Barnard	30	Coldwater
Chester Kenneth Barnard		Cleveland, O.
Harold Ashton Barnard		Jackson
Harold Draeggert Barnard	21	Constantine
Raymond Walter Barnard	65	Detroit
George Glenn Barnes	23	Greenville
Theodore Swift Barnett	30	Potsdam, N. Y.

Lawrence Roland Barnich	27	Cheboygan
Florence Elberta Barns		Jackson
Jessie Florena Barnum	30	Port Huron
Robert Clinton Barnum	25	Niagara Falls, N. Y.
Lester Stewart Barr		Washington, D. C.
Robert Winthrop Barr, Jr.		Chattanooga, Tenn.
James Madison Barrett, Jr.	30	Fort Wayne, Ind.
John Henry Barrett		Waterbury, Conn.
Anna Claire Barron	48	Gladstone
Harry E. Barrows	30	Ann Arbor
Edward Theodore Barthel		Detroit
Dorothy Bartholf	29	Glencoe, Ill.
Benjamin Arvin Bartlett	103	Saginaw
Treffley Forest Bartlett	58	Ironwood
Frank Montell Bartow	51	Ridgewood, N. J.
Nora Mae Bartrem	66	Port Huron
Margaret Ann Bassett		Toledo, O.
Clyde Emerson Bastian	29	Williamsport, Pa.
Lloyd Edgar Battles		Baraboo, Wis.
Keith Wheller Baughman	30	Albion, Ind.
William S. Baum	30	Saginaw
Elden Charles Baumgarten	51	Richmond
Ruby Elizabeth Bowden	30	Painesdale
George Gibson Baxter		Ann Arbor
John Andrew Baxter		Romulus
Richard Hugh McDowell Bayley	28	Marcellus
Robert Stanley Beach		Saginaw
Frank Johnson Beachly	24	Meyersdale, Pa.
Wesley Bryson Beadle	56	Ypsilanti
Travis Field Beal		Ann Arbor
Horace Phelps Beale	78	Sidney, N. Y.
Edgar Beardslee, m	93	Pontiac
†Frederick G. Beattie, l		Toledo, O.
Helen Marceline Beaumont		Canton, O.
Melvin Montgomery Beaver	30	Fort Wayne, Ind.
Louis Rexford Bebout		Pontiac
Albert Salter Beck		Detroit
George Pomeroy Becker	56	Ypsilanti
Isador Solomon Becker	64	Chicago, Ill.
Marshall Albert Becker	56	Ann Arbor
Myron George Becker, m	95	Benton Harbor
Samuel William Becker	30	Benton Harbor
Eula Lee Beebe	90	Jackson
Ralph Waldo Beebe	S	Detroit
Wilbur Holmes Beery		Covington, O.
Charles Elmore Begole	51	Marquette
Fred Hurlburt Begole, Jr.	31	Marquette
Minnie Augusta Behm		Mount Clemens
Ferdinand George Behmlander	34	Bay City

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Corydon Whitten Bell			<i>Sandusky, O.</i>
Douglas Hyde Bell	58		<i>Jordonville, N. Y.</i>
Edgar Wallace Bell	88		<i>Terre Haute, Ind.</i>
Harrington Alexander Bell			<i>Oak Park, Ill.</i>
Harry Leo Bell, l	92		<i>Balbec, Ind.</i>
Paul Porter Bell	26		<i>Negaunee</i>
George Neal Belser	28		<i>Chelsea</i>
Rhebá Marguerite Benaway	38		<i>Ann Arbor</i>
Irving Edison Bender	65		<i>Buffalo, N. Y.</i>
Norman Charles Bender			<i>Buffalo, N. Y.</i>
†Theodore Knapp Bender, ea	26		<i>Grand Rapids</i>
Leroy Doig Benedict	48		<i>Turin, N. Y.</i>
Anna Lillian Benjamin	56		<i>Grand Rapids</i>
Albert Arms Bennett	41		<i>Birmingham</i>
Richard Henry Bennett			<i>Laurium</i>
John Wellis Bennie	19		<i>Clifton, Ariz.</i>
LeRue Pierce Bensing	97		<i>Lebanon, Pa.</i>
Edith Louise Benson	78		<i>Fort Worth, Tex.</i>
Alvin Morell Bentley	30		<i>Owosso</i>
Stanard Gustaf Bergquist	63		<i>Ironwood</i>
Daniel DeWitt Bernard	59		<i>Muncie, Ind.</i>
Joseph Alexander Bernard	29		<i>East Saint Louis, Ill.</i>
Julius Loeser Berns	30		<i>Cottage Grove</i>
Theodor William Berthold			<i>Walla Walla, Wash.</i>
John Andrew Bertolero			<i>Lead, S. Dak.</i>
Charles Walter Betts			<i>Buffalo, N. Y.</i>
Karl Sawtelle Betts	83		<i>Kansas City, Kans.</i>
Robert Jamieson Betts			<i>Freeport, Ill.</i>
Esther Betz	71		<i>Ann Arbor</i>
Helena Augusta Beutler	52		<i>Detroit</i>
Bert Ira Beverly			<i>Ann Arbor</i>
Adele Henrietta Beyer	30		<i>Detroit</i>
Diego Abraham Biascoechea, m	117		<i>San Juan, P. R.</i>
LeRoy H. Bibby			<i>Reed City</i>
Edward Albert Biber			<i>Lansing</i>
Arthur Peter Bick			<i>Toledo, O.</i>
Kathryn Isabel Bierkamp	30		<i>Detroit</i>
Stuart Judson Bierly	58		<i>Sturgis</i>
Irene Arnetta Bigalke	93		<i>Ann Arbor</i>
Estelle Agnew Biggerstaff	90		<i>Altus, Okla.</i>
Kenith Raymond Bihlmire			<i>Baroda</i>
Edith Estella Bingham	44		<i>Farwell</i>
Thusnelda Caroline Binhammer			<i>Sebewaing</i>
Edward Jacob Bird	88		<i>Mayville</i>
Walter Duane Bird	48		<i>Nogales, Ariz.</i>
Gertrude Lillian Birmingham	61		<i>Bradford, Pa.</i>
Hobart McKinley Birmingham			<i>Pittsburg, Pa.</i>
Laura Grace Birmingham			<i>Bradford, Pa.</i>
Elliot Walter Bisbee	26		<i>Moretown, Vt.</i>

Firmin Joseph Bishop		<i>Sault Ste. Marie</i>
Mary Emmeline Bishop	94	<i>Dowagiac</i>
Rose Eugenia Bjork	91	<i>Crystal Falls</i>
Harry Billings Black	88	<i>Flint</i>
James McKee Black	94	<i>Detroit</i>
Simeon Rexford Black	30	<i>Flint</i>
William Thompson Black		<i>Detroit</i>
Helen Viola Blair	30	<i>Ann Arbor</i>
Donald Rae Blakeslee	30	<i>Detroit</i>
James Lee Blanding	30	<i>Moline, Ill.</i>
Paul Beecher Blanshard	93	<i>Ann Arbor</i>
Virgil Thomas Bledsoe		<i>Oklahoma City, Okla.</i>
Helen Mae Blew	93	<i>Detroit</i>
George Brockway Bliss	22	<i>Saginaw</i>
Anna Dorothea Block	88	<i>Freeland</i>
Alice Julia Blodgett		<i>Bay City</i>
John Ernfred Blomstrom		<i>Ironwood</i>
Abraham Jason Bloomberg	57	<i>Tupper Lake, N. Y.</i>
Lyman Ralph Blossom		<i>Grand Rapids</i>
Mildred Miriam Blumenthal	15	<i>West Branch</i>
Max A. Blumer, m	60	<i>Pittsburg, Pa.</i>
Gertrude Veronika Bogenrieder	106	<i>Detroit</i>
Margaret Elizabeth Bogenrieder	30	<i>Detroit</i>
Morgan Willard Bohart		<i>Plattsburg, Mo.</i>
William Ranke Bohne		<i>Fort Wayne, Ind.</i>
Samuel Edward Boim	53	<i>Cleveland, O.</i>
Ethelyn Redpath Bolen		<i>Battle Creek</i>
Paul Edward Bollenbacher	89	<i>Celina, O.</i>
Keitha Leora Bolles	30	<i>Houghton</i>
Julian Bomash		<i>Chicago, Ill.</i>
James Ewing Bond	92	<i>Fort Wayne, Ind.</i>
Walter Edwin Bond	87	<i>Ann Arbor</i>
George Chester Booth, d	95	<i>Indianapolis, Ind.</i>
Edward Rahr Borchardt		<i>Davenport, Ia.</i>
Stanley John Borucki		<i>Manistee</i>
Marie Josephine Boos	58	<i>Battle Creek</i>
Elizabeth Thurber Bostwick	72	<i>Alpena</i>
Charles Ancil Bosworth	30	<i>Paola, Kans.</i>
Albert Edward Bothe	23	<i>Camden, N. J.</i>
Justus Joseph Boucher	27	<i>Stephenson</i>
Kenneth F. Boucher	35	<i>Jackson</i>
Thomas Lothrop Bourne	97	<i>Hamburg, N. Y.</i>
Harold Mathew Bowcock	30	<i>Springfield, Ill.</i>
Marion Grace Bowen	4	<i>Detroit</i>
Minerva Luella Bowen	67	<i>Grand Rapids</i>
Paul Murray Bowen	38	<i>Detroit</i>
William Kordes Bowen	29	<i>Ann Arbor</i>
Pearl Katherine Bowman	94	<i>Myerstown, Pa.</i>
Charles Ward Boyce	85	<i>Ann Arbor</i>

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Jennie Iorano Boyce	97	Ann Arbor
Donald Meredith Boyd		Mount Vernon, N. Y.
John Linn Boyd		Lansing
Herrmann Eugene Bozer	30	Logansport, Ind.
Myron West Bradbeer		Mount Vernon, N. Y.
Ethel Pearl Bradley	11	Battle Creek
Enos Bradner	61	Powers
Melvin Ira Bradner	30	Powers
George Keyports Brady	30	Muskegon
Harry Asahel Brady	95	Allegan
Clifford Wayne Brainard	30	Battle Creek
Romaine Bramwell	62	Corunna
Helen Gertrude Brandebury	101	Huntington, W. Va.
Elmer Brandell	30	Anoka, Minn.
Helen Surridge Brander	30	Kalamazoo
Christina Beryl Brandstetter	22	Middleville
Hugo Edward Braun	30	Saginaw
Henry Stuart Breathwaite	60	Ann Arbor
Warren Conrad Breidenbach, m	60	Piqua, O.
Daniel Reuben Brenton	30	Salem, Mo.
Charles Harold Breyman		Toledo, O.
Edith Irene Brice	88	Manistee
Ethel May Brice	90	Manistee
Robert Bridge	26	Charlevoix
Joseph H. Bridges	105	Detroit
Martin Calkins Briggs	90	Saint Paul, Minn.
Hazel Eileen Brightman		Ann Arbor
Bruce Ditmas Bromley	94	Pontiac
Edna Elizabeth Bromley	30	Detroit
Karl Henry Bronson	30	Livonia, N. Y.
Florence Marie Brooker		Cass City
Elmer Edwin Brooks		Ann Arbor
Edith Elizabeth Brotherton	15	Detroit
Joseph Jerome Brotherton		Detroit
Wilber Esmond Brotherton, Jr.	30	Detroit
Cecil Auger Brown	60	Chicago, Ill.
Chester Henry Brown, Jr.		Constantine
Edwin George Brown	97	Detroit
Estella Wilde Brown		Battle Creek
Florence Maybelle Brown	52	Ann Arbor
Harry Edward Brown	86	Grand Rapids
Helen Elizabeth Brown	93	Ishpeming
Henrietta May Brown	118	Jackson
Kilburn Roby Brown	22	Chicago, Ill.
Reuben John Brown	60	Honesdale, Pa.
Robert Kennard Brown	30	Pittsburg, Pa.
Ruth Isabelle Brown	32	Ann Arbor
Walter Robert Brown		Rochester, N. Y.
William Rexford Brown	18	Buffalo, N. Y.

Morton Emmons Brownell, *m* 117
 William George Brownrigg
 Fay Eugenia Brunn 50
 Arthur Louis Brunner 62
 Leon Mark Brusstar 88
 Claude Sharp Buchanan 15
 Lucie Büchler
 Ernestine Louise Buckley 38
 Mahlon Wilson Budd
 Raymond Budd 30
 Leavitt James Bulkley
 Eugene Loving Bulson
 John Joseph Burby 103
 William Edward Burby
 Kenneth Warren Burdick 30
 Kemp Stucky Burge
 Robert Julius Burghard
 James Edmund Burke 23
 Helen Stewart Burlingham 66
 Leo Noble Burnett 106
 Verne Edwin Burnett
 Florence Alice Burridge 88
 Vera Mildred Burridge 58
 Raymond Earl Burrows
 Esther Louise Bury 31
 Helen Elizabeth Bush
 Clesson Taggart Bushnell 58
 George J. Busman 30
 Raymond Alfred Butler 26
 Ronald Augustus Butler 30
 Ruth Butler
 Paul John Buttles 86
 James Lillie Butts
 Ethel May Buzby 63
 Lea Valorus Bybee 30
 Charles William Caccamise
 John Patrick Caffey 28
 Marguerite Helen Caley 26
 Hobart Melville Calkins 110
 Harry Leslie Calvin
 Jessie Margaret Cameron 100
 Edward Brown Campan 30
 Catharine Maria Campbell 60
 Duncan Campbell, *m* 88
 George Albert Campbell
 James Malcolm Campbell
 James Maurice Campbell 38
 Mary Elizabeth Campbell 88
 Mary Lavinia Ives Campbell 57

Oneonta, N. Y.
 Manistee
 Saint Joseph
 Carbondale, Pa.
 Detroit
 Grand Rapids
 Rostatt, Germany
 Detroit
 Newton, N. J.
 Montevideo, Minn.
 Detroit
 Fort Wayne, Ind.
 Ann Arbor
 Ann Arbor
 Turin, N. Y.
 Louisville, Ky.
 Detroit
 Kalamazoo
 Ann Arbor
 Ann Arbor
 Ann Arbor
 Grand Rapids
 Chicago, Ill.
 Vermilion, O.
 Detroit
 Corunna
 Bronson
 Coopersville
 Detroit
 Ann Arbor
 Frankfort
 Faust, N. Y.
 Lawrence
 Woodstown, N. J.
 Mentone, Ind.
 LeRoy, N. Y.
 Salt Lake City, Utah
 Lapeer
 Ann Arbor
 Detroit
 Bay City
 Alto
 Leslie
 Munising
 Lead, S. Dak.
 Saugatuck
 Plymouth
 Shelby
 Ann Arbor

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William James Campbell	30	<i>Ann Arbor</i>
Dudley Vernon Canfield		<i>Alpena</i>
Marjorie Mary Carlisle		<i>Mount Pleasant</i>
Ernest Rutherford Carlo	25	<i>Van Wert, O.</i>
Ralph Klise Carman		<i>Bartlesville, Okla.</i>
Ruth Alice Carmichael	40	<i>Franklin, Pa.</i>
Lillian Carnegie		<i>Detroit</i>
George Clark Caron	105	<i>Detroit</i>
Alice Ruth Carpenter	62	<i>Grand Rapids</i>
Guy Carpenter	89	<i>Ann Arbor</i>
Hiram Beach Carpenter	90	<i>Rockford, Ill.</i>
Mildred Malvina Carpenter	31	<i>Grand Rapids</i>
William Randolph Carpenter	31	<i>Marion, Kans.</i>
Eber Malcolm Carroll	30	<i>Ann Arbor</i>
Ralph Moore Carson		<i>Ann Arbor</i>
Elbert Armstrong Carter, l	96	<i>Defiance, O.</i>
Milton Darwin Carter	90	<i>South Haven</i>
John Audley Carukin		<i>Grand Rapids</i>
Harry Clyde Carver	65	<i>Waterbury, Conn.</i>
Carol Bruce Cary		<i>Arkansas City, Kans.</i>
Norman Leroy Cary	63	<i>Detroit</i>
Carl Nelson Case		<i>Kingsley</i>
Joseph Carmon Casello	16	<i>Port Huron</i>
William S. Caswell	53	<i>Birmingham</i>
James Bland Catlett	60	<i>Brookings, S. Dak.</i>
†Horace James Caulkins, p	22	<i>Detroit</i>
Lester LeFevre Cecil	26	<i>West Milton, O.</i>
Jacob H. Chalot, m	69	<i>Detroit</i>
Katherine McFarlane Chamberlain	83	<i>Port Huron</i>
Martin Townsend Chamberlin	30	<i>South Livonia, N. Y.</i>
Helen Lillian Champion		<i>Detroit</i>
Hazel Theresa Champlin	85	<i>Little Valley, N. Y.</i>
John Brown Francis Champlin	26	<i>Little Valley, N. Y.</i>
Chan Ou Chan		<i>Canton, China</i>
Chuan Cin Chang	86	<i>Fukien, China</i>
Ting Tsang Chang		<i>Woosien, Shensi, China</i>
Elbridge Wellington Chapman	67	<i>Hillsdale</i>
Bessie St. John Chase	92	<i>Detroit</i>
Homer Bornboy Chase		<i>Willmar, Minn.</i>
William Byer Chase	56	<i>Unadilla Forks, N. Y.</i>
John Burch Chattin		<i>Mountain Home, Idaho</i>
Alberto Jacobo Chaves		<i>Buenos Aires, Argentina</i>
Harvey Rollin Cheesman	S	<i>Los Angeles, Cal.</i>
Queh Kiung Chen		<i>Sansee, Hunan, China</i>
James Emil Chenot	30	<i>Detroit</i>
Albert Dewitt Chipman	89	<i>Grand Rapids</i>
Clifford Earl Chipman	93	<i>New London, Conn.</i>
Gaylord H. Chizum, l	93	<i>Ann Arbor</i>
Mabel Louisa Christen	S	<i>LeMoyne, O.</i>

Clarence Arthur Christensen, <i>m</i>	90	<i>Detroit</i>
Ruth Jeanette Christensen	59	<i>Northville</i>
Edwin R. Christie	13	<i>Muskegon</i>
Laurence A. Sylvester Chrouch	30	<i>Kalamazoo</i>
Conrad Nathaniel Church		<i>Ann Arbor</i>
Felix Marshall Church	98	<i>Ann Arbor</i>
Fiske St. John Church	15	<i>Utica</i>
Gaile Churchill	88	<i>Ann Arbor</i>
Aaron Hamilton Chute	30	<i>Toledo, O.</i>
Kenneth Smith Clapp	30	<i>Albion, Ind.</i>
Albert Tuttle Clark	65	<i>Clinton</i>
Charles Elliot Frazer Clark	81	<i>Detroit</i>
Harry Leroy Clark		<i>Ann Arbor</i>
Helen Frances Clark		<i>Grand Haven</i>
Helen Lucy Clark	72	<i>Ann Arbor</i>
John S. Clark		<i>Avilla, Ind.</i>
Mary Laura Clark	54	<i>Clinton</i>
Theodore Harvey Clark	91	<i>Stone Haven, Scotland</i>
Waldina Isabel Clark		<i>Detroit</i>
†Willard Huntington Clark, <i>e</i>		<i>Rochester, N. Y.</i>
Charles Brooks Cleary	93	<i>Ypsilanti</i>
Glendon Twilley Clements		<i>Gregory</i>
Mary Clarissa Cleveland	91	<i>Middlesex, N. Y.</i>
Ralph K. Clifford	82	<i>Kokomo, Ind.</i>
Lyle Minar Clift, <i>l</i>	92	<i>Bay City</i>
Mabel Frances Clinton	48	<i>Pinckney</i>
Arvilla Ruth Closser	26	<i>Alpena</i>
Susanna Ada Clough	68	<i>Detroit</i>
Melissa Hazel Cobb	90	<i>Ann Arbor</i>
John Warner Codd		<i>Detroit</i>
Ira Cohen	92	<i>Buffalo, N. Y.</i>
Joseph Cohen		<i>Brooklyn, N. Y.</i>
Leon Basil Cohen, <i>m</i>	62	<i>Harrisburg, Pa.</i>
†Samuel Cohen, <i>e</i>		<i>Rochester, N. Y.</i>
Samuel Louis Cohen	30	<i>Virginia, Minn.</i>
Herman Tucker Cohn		<i>Springfield, Ill.</i>
Isador Mayer Cohn		<i>Spokane, Wash.</i>
Isadore Cohn		<i>Detroit</i>
Loyal Brandeis Cohn	37	<i>Omaha, Nebr.</i>
Martha Agnes Colborne	49	<i>Detroit</i>
John Paul Colden		<i>Clarion</i>
Herman Harrison Cole, <i>m</i>	62	<i>Alton, Ill.</i>
Ralph Phelps Collier		<i>Battle Creek</i>
Florence E. Colling	95	<i>Caro</i>
Marie Kingston Collins		<i>Grand Rapids</i>
Russell Stebbins Collins	30	<i>Detroit</i>
Myra Mae Collinson	82	<i>Port Huron</i>
José Colón	36	<i>Arecibo, P. R.</i>
Boyd McClellan Compton	29	<i>Dayton, O.</i>

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Freeman Jonathan Comstock		<i>Grand Rapids</i>
Ralph Gilbert Conger	91	<i>Grand Rapids</i>
Albert Degolyer Conkey	30	<i>Benton Harbor</i>
Louise Ward Conklin	111	<i>Ann Arbor</i>
Theodore Hill Conklin	60	<i>Kingston, N. Y.</i>
†Gerald John Conlin, l	26	<i>Adrian</i>
Alice Lauretto Connelly	62	<i>Bessemer</i>
Jack Howard Connelly		<i>Quincy, Ill.</i>
Emmett Francis Connely	62	<i>Adrian</i>
Harry J. Connine	84	<i>Grayling</i>
Helen Mae Connolly	94	<i>North Lawrence, N. Y.</i>
Anita Connors	65	<i>Detroit</i>
Leo Carl Henry William Conradi	94	<i>New Bremen, O.</i>
Ernest Anderson Cook	92	<i>Fenton</i>
Georgia Helen Cook	85	<i>Grove</i>
Granville Marr Cook		<i>Hopkinsville, Ky.</i>
Edwin Theodore Cooke		<i>Maumee, O.</i>
Jean Paul Cooley		<i>Erie, Pa.</i>
Margaret Hamilton Cooley	11	<i>Jamaica, N. Y.</i>
Rutger Horton Cooley	36	<i>Ann Arbor</i>
Elsie Evelyn Cooper	115	<i>Port Huron</i>
Hester Laura Cooper		<i>Detroit</i>
James Bradley Cooper, Jr.	15	<i>Hubbell</i>
John Senter Cooper		<i>Hubbell</i>
Elaine Florence Corbett		<i>Menominee</i>
Cecil Bradford Corbin		<i>Alpena</i>
Rolland Earl Corbin	23	<i>Ann Arbor</i>
Diana Corey	26	<i>Bay City</i>
Genevieve Beecher Corey	26	<i>Portland, Me.</i>
Genevieve Columbia Corkell	56	<i>Chicago, Ill.</i>
Mariola Cornell	30	<i>Valparaiso, Ind.</i>
Alice Marie Cornwell	103	<i>Ann Arbor</i>
Lisle Chester Cortright		<i>Nashville</i>
Harold Benn Corwin		<i>Grand Rapids</i>
Charles Alexander Coryell		<i>Bay City</i>
†Carson Augustus Cosgrove, e	12	<i>Owosso</i>
Frank Boyd Cotner		<i>Strawberry Ridge, Pa.</i>
Joseph Ray Cotton	25	<i>Lewistown, Mont.</i>
Glenn Monroe Coulter	42	<i>Chittenango Station, N. Y.</i>
Edward Albert Cournyer	61	<i>Ferrysburg</i>
Blanche Rose Covey		<i>Coldwater</i>
Leo Francis Covey	62	<i>Coldwater</i>
Harry Clayton Cowan	74	<i>Walla Walla, Wash.</i>
Glen Lincoln Cowing, l	92	<i>Joliet, Ill.</i>
Henry Lye Cowlin	17	<i>North Crystal Lake, Ill.</i>
Theodore Sullivan Cox		<i>Brightwood, D. C.</i>
Irene Jessie Crabb	38	<i>Grand Rapids</i>
Etta Jean Craig	60	<i>Victoria</i>
†James Blodgett Craig, e	84	<i>Detroit</i>

Adele Louise Crandall		Ann Arbor
Ruth Dulty Crandall	90	Ann Arbor
William Tilden Crandell		Bellevue
Harold Raymond Crane	94	Ann Arbor
Percy Hatfield Crane	58	Charlevoix
Eliza Erskine Cranmer	104	Steuenville, O.
Carleton Hall Crawford		Bellevue
Charles Butler Crawford	30	Davenport, Ia.
N. Russell Crawford		Grand Rapids
Norman Frayne Crawford		Detroit
Mary Neva Creighton	38	Franklin, Pa.
Margaret Adele Creswell		Grand Rapids
Helen Marie Crill	30	Ann Arbor
Innez Lucile Crill		Ann Arbor
Helen Jean Croman	89	Mount Clemens
Roland Spuhler Cron, m	61	Manistee
Daniel Henry Cronin	32	Ann Arbor
Eleanor Clarisa Crosby		Marion, Ind.
Cecil Frank Cross		Wayne
John Russell Crossland	11	Saint Joseph, Mo.
Wilford Thomas Crossman	26	Grand Rapids
Vernon Culp	59	Oshkemo
Ida Amelia Culver		Jackson
Harold Cummins	45	Ann Arbor
Harry Tische Cummins	30	Jefferson, O.
Rex Barnard Cunliffe	27	Detroit
Leon Max Cunningham	27	Bay City
Paul Harvey Cunningham, l	93	Indiana, Pa.
Walter Graham Cunningham		Pekin, Ill.
Lloyd Joseph Curby		Beaverville, Ill.
Meroe Louise Curry	46	Detroit
Fred Plumer Currier, m	108	Yale
Erta Agnes Curtis	87	Big Rapids
Hilda Cushing	62	Bear Lake
James Leslie Cutler		Ann Arbor
Robert Fredrick Cuyler	56	Newark, N. Y.
Alice Clara Dagner	101	Romeo
Edward Fredrick Dahlin	92	Kent City
Clifton Louis Dance	22	Detroit
Evelyn Mae Dancer	61	Ann Arbor
Joseph Rogers Darnall	30	Washington, D. C.
Chester Tom Darnton		Adrian
Alice Marie Darrow	103	Ann Arbor
Margaret Jane Darrow		Ann Arbor
Edward Charles Daum		Pittsburg, Pa.
Earl Davenport		Harrisburg, Ill.
Dorothy Lynne Davidson	79	Evanston, Ill.
Harry Blair Davidson, Jr.		Springfield, Ill.
Jean Davidson	60	Hubbell

Joseph Moore Davidson	18	<i>Saint Joseph, La.</i>
Wilbur Seymour Davidson	62	<i>Port Huron</i>
Florence Marian Davis	61	<i>Owosso</i>
Gertrude Haug Davis	60	<i>Detroit</i>
Harold McLean Davis		<i>Clinton</i>
Louise Barber Davis	28	<i>Battle Creek</i>
Mary Ellen Davis	56	<i>Ypsilanti</i>
Raymond Elmer Davis		<i>Sandusky, N. Y.</i>
Ruby Amanda Davis		<i>Chili Station, N. Y.</i>
Winfield Wells Dawley		<i>Conneaut, O.</i>
Marcus Motier Day	12	<i>Providence, R. I.</i>
John Edwin Deal	96	<i>Detroit</i>
Harold Reynolds Dean	90	<i>Poughkeepsie, N. Y.</i>
Maybelle Aileen Dean	98	<i>Detroit</i>
Russell Eugene Dean	52	<i>Milwaukee, Wis.</i>
Metta Edythe DeBarr	60	<i>Ann Arbor</i>
Thomas Greene DeCoudres	20	<i>Long Beach, Cal.</i>
Walter Leroy DeLano		<i>Otsego</i>
Carlyn Chase Delavan	85	<i>Alma</i>
Marjorie Delavan	66	<i>Alma</i>
Ralph Sidney Delbridge		<i>Jackson</i>
Beulah West DeLong		<i>Elyria, O.</i>
Elwood Leonard Demmon	96	<i>Grand Rapids</i>
Marguerite Julia Denfeld	77	<i>Saginaw</i>
Arthur Curtis Denison	39	<i>Grand Rapids</i>
Catherine Louise Densmore	62	<i>Saint Ignace</i>
Gail Ernest Densmore		<i>Mason</i>
Angelo Raphael Dente		<i>Saginaw</i>
Emerson DeSpelder		<i>Zeeland</i>
Harry Herbert Déspond		<i>Hamilton, O.</i>
John Starkweather Deubel	52	<i>Ypsilanti</i>
George Harvey Deuble	94	<i>Canton, O.</i>
Harry Nathan Deyo		<i>Rockford</i>
Jean Livingston Diamond	30	<i>Galion, O.</i>
Leonard Patrick Diederichs	15	<i>Iron River</i>
Willis Alcott Diekema	95	<i>Holland</i>
Herbert Daniel Dieterle	70	<i>Ann Arbor</i>
Hilda Caroline Dieterle		<i>Ann Arbor</i>
John Otto Dieterle, m	66	<i>Ann Arbor</i>
Arthur Herbert Dilley		<i>Corydon, Ia.</i>
Joseph Isaac Dillon	30	<i>Benton, Ill.</i>
Dorothy Helen Diss		<i>Cleveland, O.</i>
Ross Morton Dixon	4	<i>Northville</i>
Leland Ira Doan		<i>Ann Arbor</i>
Max Dobrin, m	91	<i>Montclair, N. J.</i>
Wyllis Osborn Dodge	22	<i>Lansing</i>
Katherine Mary Doherty		<i>Detroit</i>
Douglas Donald	71	<i>Detroit</i>
Herbert Horace Donnelly	17	<i>Toledo, O.</i>

Howard Albert Donnelly
 Gerald Richard Donohoe
 Albert Anson Dorrance 30
 Geoffrey Austin Dorsey
 Edna Ida Doud 26
 Margaretta Biddle Douglas
 Caroline Miller Dow 93
 Helen Dow 31
 Ruth Alden Dow
 Edgar Fielding Down 68
 George Christopher Doyle
 Gertrude Margaret Doyle 71
 Kenneth Owen Doyle
 Langden Earl Doyle 30
 Joseph Horace Drake, Jr. 32
 Rollin Edwards Drake 9
 Lenore Cozadd Draper 62
 Elsie Anna Drefflein
 Aloysia May Driscoll 88
 Elsa Matilda Drittler 52
 Russell Earl Driver 48
 Isabel Drummond 91
 Lela Adelaide Duff 60
 Henry Cowie Duffield 30
 Walter Dufford
 †Ralph Edwin Dunham, I 24
 Gaius Herbert Dunlap 26
 Phyllis Evadne Dunn 88
 Thomas Warren Dunn 9
 Maurice Francis Dunne
 Louie Heber Dunten, I 97
 Frank Joseph Dupras 91
 Francis Thomas Dwyer 49
 Adeline June Dykes 62
 Ernest Eugene Eady 27
 Alice May Earle
 George Harwood Earle 91
 Stewart Edward Earle
 Harold Mulkley Easley 34
 Kenneth Alexander Easlick
 Ray Gerald Easton 27
 Margaret Eaton 109
 Gilbert Stuart Ebert 30
 Amy Lucile Ecker 26
 Jerone Josiah Edmundson 70
 John William Edwards
 Maude Edwards 72
 William Churchill Edwards
 William James Edwards

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 Waterville, Wash.
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 Detroit
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 Duluth, Minn.
 Buffalo, N. Y.
 Menominee
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 Ann Arbor
 Ann Arbor
 Ann Arbor
 Oak Park, Ill.
 Hubbell
 Hancock
 Marquette
 Philadelphia, Pa.
 Saint Louis
 Detroit
 Casey, Ill.
 Concord
 Holly
 Iron River
 Buffalo, N. Y.
 Springfield, Ill.
 Hometown, Ind.
 Hubbell
 Ann Arbor
 Kane, Pa.
 Otsego
 South Haven
 Valparaiso, Ind.
 Hermansville
 Detroit
 Onsted
 Ann Arbor
 Jackson
 Galion, O.
 Cleveland, O.
 Birmingham, Ala.
 Ann Arbor
 Calumet
 Flint
 Detroit

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William John Egan, <i>m</i>	93	<i>Hurley, Wis.</i>
Arnold Henry Eggerth		<i>Ann Arbor</i>
George Henry Ehrlicher	99	<i>Pekin, Ill.</i>
Minnie Catharine Einfalt	18	<i>Saginaw</i>
David Christian Eisele, <i>m</i>	60	<i>Albany, N. Y.</i>
Gordon Cope Eldredge	89	<i>Adrian</i>
Douglas Stilwill Elliott	30	<i>Sioux Falls, S. Dak.</i>
Ruth Elliott	30	<i>Detroit</i>
George Melvin Ellis	30	<i>Detroit</i>
Manley Mills Ellis		<i>Trout Creek</i>
Roland Earl Ellis		<i>Akron, O.</i>
Remington Ellis		<i>Rochester, N. Y.</i>
Helen Roberts Ely	30	<i>Tarrytown, N. Y.</i>
Leon Abbett Ely	70	<i>Rutherford, N. Y.</i>
Crystal Golding Emerson		<i>Toledo, O.</i>
Mary Lee Emerson	82	<i>Chickasha, Okla.</i>
Pauline Olga Emerson	30	<i>Ann Arbor</i>
Ralph Lewis Emmons	59	<i>Borodino, N. Y.</i>
Margaret Engels		<i>Ann Arbor</i>
Clifford Gordon Engle		<i>Toledo, O.</i>
Earle James Engle	71	<i>Ann Arbor</i>
Thomas Joseph Enright		<i>Erie, Pa.</i>
Oliver Bruce Enselman	61	<i>Washington, Ill.</i>
Arvid Waldemar Erickson	30	<i>Ironwood</i>
Mary Josephine Erickson, <i>m</i>	71	<i>Hancock</i>
Emma Joy Erwin	31	<i>Oak Grove</i>
John Martin Erwin	54	<i>Groton, S. Dak.</i>
Florence Victoria Essery	94	<i>Ann Arbor</i>
Edward Dickinson Ettinger	64	<i>Angola, Ind.</i>
Edward Simpson Everett	99	<i>Brook, Ind.</i>
Francis Leonard Everett	9	<i>Sault Ste. Marie</i>
Benham Ewing	119	<i>Brooklyn</i>
Earle Edlin Ewins	30	<i>Cedar Rapids, Ia.</i>
Ruth Helen Exelby	30	<i>Britton</i>
Myrtle Henrietta Exley	26	<i>Hancock</i>
Esther Fairbanks	90	<i>Saline</i>
Lulu Ruth Faling	90	<i>Kalamazoo</i>
Frances Farnham	68	<i>Ann Arbor</i>
Caroline Eleanor Farr	65	<i>Grand Haven</i>
Edith Frances Fast	20	<i>Paulding, O.</i>
Loyd Anderson Faxon	24	<i>Sandwich, Ill.</i>
Joseph Hamilton Fee	30	<i>Detroit</i>
Laura Marie Feige	60	<i>Ann Arbor</i>
Martin Feinstein	87	<i>Brooklyn, N. Y.</i>
Roy Randolph Fellers	72	<i>Coleman</i>
Waldo Emerson Fellows	97	<i>Bay City</i>
Florence Fenwick		<i>Ann Arbor</i>
Clarence Newton Ferguson		<i>Sault Ste. Marie</i>
Lynn Adelbert Ferguson, <i>m</i>	63	<i>Sparta</i>

Patricia Ferguson	22	Detroit
Mark Ferrell	57	Sedalia, Mo.
Russell William Ferrell		Barberton, O.
Blanche Marie Field	88	Quincy
Kathleen Beatrice Field	53	Detroit
Willis Sherwood Field	61	Grand Rapids
Stanley Lyon Fildew		Pontiac
Russell Leslie Finch		Detroit
Laura Evangeline Finegan		North Rush, N. Y.
David Harold Fink	30	Detroit
Donald Arthur Finkbeiner		Perrysburg, O.
Gertrude Mary Fischer	30	Ann Arbor
Alice Marie Fish		Grand Rapids
Howard Power Fisher	23	Detroit
Ferris Humphrey Fitch	65	Stockbridge
Marjorie Fitch	64	Stockbridge
William Emery Fitch		Detroit
Joe Wesley Fitts	70	Madison, S. Dak.
Harold Alvin Fitzgerald		Flint
James Edward Fitzgerald	86	Valley City, N. Dak.
Jesse John Fitzgerald	89	Shepherd
Erwin Henry Fleck	40	Detroit
Grace Irene Fletcher	31	Chelsea
Harris Francis Fletcher	72	Ypsilanti
Fred Sylvester Flick	95	Hasleton, Pa.
Erwin Leonard Flint	30	Tonica, Ill.
Raymond Edgar Flynn		Croswell
†Albert Sylvester Foess, ea	64	Lansing
Ira Blair Fogelsonger, Jr.	26	Ann Arbor
Honora Marie Fogerty	60	Ann Arbor
Ralph Eugene Folz		Kalamazoo
Stanley George Fontanna		Powers
Margaret Ruth Foote	58	Muskegon
Marshall Warren Foote, l	98	Erie, Pa.
John Francis Foran	53	Chateaugay, N. Y.
Ida Laverne Ford	88	Ypsilanti
Walter Abram Fort, m	57	Centerville
William Henry Fort		Chicago, Ill.
George Albert Foss	60	Sturgis
John Edward Foss	31	Dunkirk, N. Y.
Linus Joseph Foster		Ann Arbor
Marion Fenwick Foster	60	Boston, Mass.
William Oscar Fowler		Greenville
Edith Mary Fox	56	Shelby
Edmund Burke Fox	56	Athens
Ethyl Marion Fox	56	Columbiaville
George Ball Fox	42	Watertown, N. Y.
Helen Edith Fox	30	Jackson
Karolena M. Fox	56	Grand Rapids

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Ralph James Frackelton	30	Fenton
Wesley George France		Sault Ste. Marie
Harry Hanson Franck, Jr.	22	Phelps, Wis.
Mollie Franklin	96	Three Rivers
William Eugene Fransham	17	Bozeman, Mont.
Elna Maria Fredeen	70	Norway
Harold Greene Freeman		Pontiac
Gordon Melrose French		Coleman
Merle Boice Fretz		Newberry
Victor Eiseman Fribourg	30	Sioux City, Ia.
Louis Kossuth Friedman	61	Pittsburg, Pa.
Alfred Spalding Friedrich	30	Traverse City
Leo Joseph Fries	69	Columbia City, Ind.
Charles Thomas Frock		Uniontown, Pa.
Harvey LeRoy Frost	46	Detroit
Leon William Frost	93	Grand Rapids
Robert Curtis Fullenwider		South Haven
John Lyon Fuller	35	McAlester, Okla.
Wilbert Heaston Fuller	44	Emporia, Kans.
Reid Stanger Fulton	90	Carsonville, Va.
Leland Ritter Funk	73	Cassopolis
Elinor Gage	85	New Hudson
Helen L. B. Gage	35	New Hudson
Frederick McMahan Gaige	94	Ann Arbor
Honor Waldo Gaines	30	Ann Arbor
Katherine Agnes Gallagher	97	Cleveland, O.
Luella Gallmeyer	35	Grand Rapids
Albert Keene Galloway	25	Washington, D. C.
Eli Albert Gallup	60	Brockport, N. Y.
Albert J. Gans	32	Louisville, Ky.
Louise Martha Garaghty		Detroit
Julius Stanley Shourds Gardner, m	90	Harbor Springs
Mary Elizabeth Gardner	72	Ypsilanti
Samuel Raymond Gardner	53	Randolph, N. Y.
Charles Comfort Garland		Dayton, O.
J. Floyd Garner	90	Flint
Howard Louis Garry		Lockport, N. Y.
John Lee Gates, m	90	Ann Arbor
Ralph Lester Gates	59	Columbia City, Ind.
Harry G. Gault	68	Flint
Gertrude Rosalie Gay	58	Milan
Thurlow William Geeck		Corunna
August Ernst Gehrke, m	61	Detroit
†Samuel Geisenberger, Jr., e	13	Natches, Miss.
Hyman Howard Gellert		Colchester, Conn.
Ernest Eugene Michael George		Flint
Florence Caroline Gerber	30	Saginaw
William McKee German	60	Pittsburg, Pa.
Clinton Harman Gernert		Louisville, Ky.

Julia Mary Gerwin 54
 Earle Willford Gibbs 14
 Ray Thomas Gibbs
 Deborah McDonald Gibson 36
 Harry Tarleton Giddings
 Irma Hazel Giddings
 Charles George Gies 91
 Anna Leona Gieske 64
 Harvey Harold Gifford
 Janet Elizabeth Gilchrist 89
 Emily Muriel Gilfillan 94
 Albert Eugene Gilinsky
 Paul Bennett Gillette 30
 Newton J. Gilliland 81
 Arthur Eugene Gilman 92
 Golda Molka Ginsburg 34
 Judith Ginsburg 73
 Harry Thomas Gisborne 30
 Vivian Mae Glauz 63
 Charlotte Gleason
 Robert Elwyn Gleason 30
 Raymond Edward Gleichauf 22
 Ralph John Gleichauf 22
 Oscar Glenn 104
 James David Glunt
 James Gardner Glynn 46
 Edward Boeck Gnahn 30
 Ethel Luella Goff 52
 Charles Lazarus Goldstein
 Bruce Eric Gollan 52
 Melvin Ralph Gombrig
 William Stephen Gonne, m 60
 Hazel Blanche Goodrich 66
 Robert Milton Goodrich
 Julius Armstrong Goodwin 17
 Benjamin Berul Gordon
 Bessie Gordon 79
 Randolph Fleming Gordon
 Richard Emanuel Gordon 30
 Agnes Harriet Gorman 30
 James Edward Gorman 21
 Abraham Jacob Gornetzky
 Inez Marie Gose
 Clarence Baker Goshorn 70
 Faith Goss 63
 Frederick Eugene Gould 95
 Frederick Foster Gould
 John Kingsley Gould, l 96
 Leo Joseph Goulet

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 Fort Madison, Ia.
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George August Grabe	24	Peotone, Ill.
Herbert Winfield Graffius	92	Spangler, Pa.
Adrain B. Graham	87	Croswell
Douglas Allan Graham	30	Detroit
Glenn Arthur Graham	4	Lapeer
Harold Walker Graham	30	West Glover, Vt.
James Walter Graham	60	Sandusky
Jane Kirkland Graham	60	Ann Arbor
John Allen Graham	82	Broomfield, W. Va.
Ralph Harold Granger	56	Morenci
Carl Melvin Graven		Jefferson, Ia.
Harold Hartung Gray		Romeo
Martha Cecilia Gray	24	Detroit
Ruth Haldemann Graybill	57	Williamsport, Pa.
Raymond Ridgely Greathouse	57	Washington, D. C.
Frances Martha Green	101	Saint Johns
† John Sidney Green, c	8	Saginaw
Harold Raymond Greene		Escanaba
Leon Greenebaum	30	Newton, Kans.
Roy Mark Greenthal	30	Detroit
Ray Elsworth Greenwood		Kankakee, Ill.
Raymond Frederick Grefe	30	Des Moines, Ia.
Gretchen Abigail Gregory	30	Ann Arbor
Helen Mae Gregory	22	Ann Arbor
John Milton Gregory	58	Menominee
Charles Henry Greiner	91	Ridgetown, Ont.
Lewis William Grice		Saint Clair
Anthony Royce Grierson	26	Saginaw
Carl Peter Griesmer		Wilkes-Barre, Pa.
Ellwood Griest	79	Lilits, Pa.
Glenn Grieve	56	Fowlerville
Howard Dixon Griffith	30	Traverse City
Henry Lawrence Grinnell	54	Grand Rapids
Durward Grinstead, l	92	Louisville, Ky.
William Charles Griswold	30	Akron, N. Y.
Elmer Hiram Groefsema	72	Mountain Home, Idaho
Watze Groen	90	Grand Rapids
Clara Harrison Grover		Grand Rapids
Harry Washington Grover	14	Ann Arbor
Walter Harring Grover		Detroit
Richard Gerveys Grylls		Detroit
Donald Welsh Gudakunst		Saginaw
Gladys June Guenther		Ann Arbor
Frances Marie Guilford		Friendship, N. Y.
Marcus Gunn	93	Detroit
Allen DeVilbiss Gutches		Toledo, O.
Gurney Otto Gutekunst	61	Gowanda, N. Y.
Carl Eugene Guthe, Jr.	91	Ann Arbor
Spencer DeWitt Guy, m	61	Coloma

Marguerite Emma Haag 58
 Merit Donald Haag
 Philip Alan Hadsell
 Gerald Hanna Hagar 90
 George Ricker Hageman
 Grace Katherine Hagen
 Lenore Haimbaugh 56
 Alice Mae Hall
 Elizabeth Olivia Hall
 Lucille Eunice Hall 11
 Philetus Doty Hall
 Reuel Roy Hall
 Robert Joseph Hall 60
 Ruby Mariett Hall 30
 Wallace Clare Hall
 Wesley Willard Hall 55
 †Howard Haynes Hallowell, 1
 Chester Raymond Ham
 Conda Jenkins Ham 63
 Jack Harry Hamill, m 63
 Ada Irene Hamilton 18
 George Conrad Hammer 94
 Ella May Hanawalt 85
 †Carl G. Handshaw, d
 Gilbert Vernet Handy 15
 Gertrude Vera Hanna 57
 Jay Eaton Hanna 26
 Nellie Julia Hanna 77
 Berenice Merl Hannan 30
 Edith Leonard Hannum 93
 Enid Adelaide Hanson 22
 Margaret Eustis Hanson
 Ralph Warren Harbert
 William Donald Hardee 22
 Elias Ely Harding 30
 Bernard Edward Harkins
 James Henry Harkless
 Marion Scribner Harlan
 Doyce Harry Harned
 Harold Leontine Harrington 74
 Jerry Ignatius Harrington 120
 Arthur Isadore Harris
 Lyle F. Harris 56
 Daniel John Harrison 60
 Don Edward Harrison
 Violet Ethelwyn Harrison
 Ward Walter Harryman
 Paul Barnard Harsha 91
 Abraham Strauss Hart

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 Spokane, Wash.
 Alpena
 Denver, Colo.
 Ann Arbor
 Ann Arbor
 Toledo, O.
 Bad Axe
 Anoka, Minn.
 Detroit
 Ridgeway
 Bad Axe
 Franklin, Ind.
 Kearney, Nebr.
 Ann Arbor
 Ann Arbor
 Bolivar, Pa.
 Ann Arbor
 Hillsboro, Wis.
 Galva, Ill.
 Mendon
 Bay City
 Ann Arbor
 Detroit
 Geneseo, Ill.
 Ann Arbor
 Kennett Square, Pa.
 Ann Arbor
 Pontiac
 Detroit
 Toledo, O.
 Buffalo, N. Y.
 Ann Arbor
 Kansas City, Mo.
 Hudson
 Jerry City, O.
 Blissfield
 Ishpeming
 Detroit
 Boyne City
 Adrian
 Saint Louis
 Ann Arbor
 Owosso
 Portsmouth, O.
 Chicago, Ill.

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William Alfred Hart	105	<i>Fredonia, N. Y.</i>
Peter Andrew van Hartesveldt, l	92	<i>Grand Rapids</i>
Olive Jane Hartsig		<i>Ann Arbor</i>
Frank McCullough Hartsook	64	<i>Cardington, O.</i>
Paul Mathew Hartt	28	<i>Bloomington, Nebr.</i>
Erwin Hartung	95	<i>Detroit</i>
DeVere Charles Haskell	34	<i>Arcade, N. Y.</i>
Clyde Knapp Hasley	58	<i>Monroe</i>
Dominic Sheridan Hastreiter		<i>Ann Arbor</i>
Mildred Anne Hatch		<i>Ann Arbor</i>
Floyd Russel Hatchew		<i>Flint</i>
Harry Ellsworth Hatcher	90	<i>Petersburg</i>
John Francis Haughey		<i>Battle Creek</i>
Myer Hausman		<i>Marysville, Kans.</i>
Morwin Haven	74	<i>Ottumwa, Ia.</i>
Harry Mack Hawley	66	<i>Ann Arbor</i>
Florence Gertrude Haxton	71	<i>Oakfield, N. Y.</i>
Herbert Patrick Hayden	27	<i>Detroit</i>
Josephine Marie Hayden	70	<i>Tecumseh</i>
Helen Maurine Hayes	56	<i>Hastings</i>
Mary Rebecca Haynes	97	<i>Ann Arbor</i>
Edwin Ray Hazen	63	<i>Erie, Pa.</i>
Elinor Heap	77	<i>Detroit</i>
Emma Elizabeth Heath	92	<i>Toledo, O.</i>
Parker Heath	30	<i>Grand Rapids</i>
Daniel Jay Heathcote	59	<i>Ferrysburg</i>
Mauritz Gustaf Hedin		<i>Ironwood</i>
Walter Daniel Heenan		<i>Flint</i>
Altha Bernice Heffellbower	31	<i>Lapeer</i>
Miriam Heideman		<i>Laurium</i>
Elmer Martin Heider	83	<i>Buffalo, N. Y.</i>
Austin William Heine, m	61	<i>Mount Clemens</i>
Leona Beatrice Heine	56	<i>Mount Clemens</i>
John Alden Heist	26	<i>Chicago, Ill.</i>
George Heitsch		<i>Pontiac</i>
William Joseph Heitsch	30	<i>Pontiac</i>
Donald Dean Held		<i>Akron, O.</i>
Harold Edward Held	27	<i>Akron, O.</i>
Marie Gertrude Helmecke	90	<i>Grand Rapids</i>
Ann Loretta Helmsdorfer	80	<i>Negaunee</i>
Albin John Hemmert		<i>Wapakoneta, O.</i>
Edna May Hendershott		<i>Manchester</i>
Charles Robert Henderson	93	<i>Ann Arbor</i>
Harold Henderson, m	91	<i>Detroit</i>
Cecil I. Henke	11	<i>Kendallville, Ind.</i>
Louis Peter Henkel		<i>Petoskey</i>
Margaret Marie Henkel		<i>Mount Clemens</i>
Julia Lathrop Henning	107	<i>Ann Arbor</i>
Victor Harold Herbert	30	<i>Detroit</i>

John Carman Herbst 11
 George Rudolph Herrmann 23
 Sophie Herrmann 93
 Jay Harry Herrick
 Myrtle Susan Heseltine 87
 Ellzadie Marie Heusel 57
 Edith May Hewitt 105
 Jay Frank Heydon 25
 Garrett Heyns 60
 Oliver Charles Heywood 62
 Guila Lynetta Hickman 34
 Frances Louise Hickok 97
 Elva Helen Hickox 60
 Braxton Hicks
 Isabel Hicks 30
 Jane Lockard Hicks 64
 Ralph Wesley Hicks 30
 Gladys Lucy Higgins 86
 Jeannette Bullis Higgins 92
 Egmont Goetz Hildner 12
 Euthymia Johanna Hildner
 Faye Jeannett Hill 88
 Henley Hill
 William John Hiller 62
 Stockbridge Carleton Hilton 15
 William Hilzinger, Jr. 24
 Mabel Deliliah Hinds 42
 Harold Hirschland 34
 Ching Tsong Ho
 George Maxwell Hoak 32
 Seth Guilford Hobart 30
 Nellie Margaret Hobbs
 Karl Biehl Hoch 95
 Catherine Elizabeth Hodson 56
 Harlan Herbert Hoffman 27
 Harry Robert Hoffman
 Ruth Audrey Hoffman
 Clara Lillian Hoffmann 92
 Rudolph Joseph Hofmann 61
 Irma Louise Hogadone 93
 Fanny Bigelow Hogan 60
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 Alberto Salomon Hoheb
 Anne Drew Holland
 Frederick Richard Gustav Hollander
 Laura Hollingshead 88
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Benjamin George Holton, m	63	Battle Creek
David Charles Holub	15	Akron, O.
Kathleen Charlotte Holznagle	55	Detroit
Bernard Stanley Hone	62	Saint Joseph
Shelby Emerson Hood		Elizabeth, Ill.
Eerde William Hoogsteen, l	101	Grand Rapids
Iama Czarina Hook		Ann Arbor
Thomas Edward Hook	79	Homesville, O.
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Jennie Estelle Hooper	30	Ishpeming
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Bertrice Marian Hopkins	86	Detroit
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Stephen Cornwell Hopkins		Cranford, N. J.
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Francis Leslie Hopkinson		Big Rapids
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Ethel Rhea Hosmer		Romeo
Tom Edwards Hough	58	Montague
Mabel Esther House	101	Ann Arbor
Ralph Doane House, l	97	Brookston, Ind.
Perry Alonzo Howard, Jr.	87	Los Angeles, Cal.
Ralph Holman Howard		Chillicothe, O.
Mary Sewall Howells		Allegan
William Edward Howes		Ann Arbor
Harry Howick	48	Celina, O.
Glenn Allen Howland		Detroit
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Yen Fang Jabin Hsu	94	Shanghai, China
David Isadore Hubar	30	Waterbury, Conn.
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Miriam Elberta Hubbard	40	East Aurora, N. Y.
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Helen Lenore Humphreys	30	Van Wert, O.
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Ray Alexander Hunter		River Rouge
Rollin Clarence Hunter		New Hudson
David Dyer Hunting	95	Grand Rapids
Robert Cutler Hunting		Grand Rapids
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Hampton Harrison Irwin		Altoona, Pa.
Walter Newton Isbell	116	Plymouth
Wesley Gulley Ives	85	Dearborn
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Elva Marjorie Jahns		Moline, Ill.
Donald Hamilton James		Detroit
Efton Murrel James	62	Vandalia
Philip Jansen	86	Chicago, Ill.
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Marguerite Jenkins		Cleveland, O.
William West Jenkins		Scranton, Pa.
Carlton Howard Jenks	73	Port Huron
Dwight White Jennings	30	Ann Arbor
Ilda Curtice Jennings	98	Saint Clair
Louis Ernest Jennings		Detroit
William Bertel Jensen	30	Grand Rapids
Paul Harold Jeserich	89	Waterliet
Leland Heath Joannes	22	Green Bay, Wis.
Christine Emma John	94	Ann Arbor
Hubert Rudolph John, m	90	Ann Arbor
Waldemar Alfred John	31	Ann Arbor
Louis Merrill Johns	11	LeMars, Ia.
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Ammi Lloyd Johnson, h	64	San Bernardino, Cal.

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Henry Adolph Johnson		<i>Ishpeming</i>
Irwin Chester Johnson	26	<i>North Detroit</i>
Leroy Charles Johnson	30	<i>South Bend, Ind.</i>
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Walter Oscar Johnson		<i>Youngstown, O.</i>
Edward McKeehan Johnston	63	<i>Valparaiso, Ind.</i>
Elwood Charles Johnston	92	<i>Detroit</i>
George Sutton Johnston	78	<i>Grand Rapids</i>
Leonard Meade Johnstone		<i>Chesaning</i>
Rae Edward Johnston	90	<i>Cadillac</i>
Avery Knowles Jones	30	<i>Denver, Colo.</i>
Clara Irene Jones	30	<i>Toledo, O.</i>
Donna Verna Jones	60	<i>Marcellus</i>
Granville D. Jones	19	<i>Columbus Grove, O.</i>
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Russell Vern Judson	86	<i>Durand</i>
Laura Julien	64	<i>Benton Harbor</i>
Mata Clara Jungnitsch	56	<i>Otsego</i>
Nathan Maurice Kahn	26	<i>Chicago, Ill.</i>
Edward William Kalding	22	<i>Detroit</i>
William Stephen Kammerer		<i>Louisville, Ky.</i>
Clifford C. Kane		<i>Raleigh, Ill.</i>
Max Bruno Kannowski	22	<i>Alpena</i>
Rolla George Karshner, m	69	<i>Big Rapids</i>
Delta May Kauffman	86	<i>Warsaw, Ind.</i>
Charles Lot Kaufman		<i>Bellefontaine, O.</i>
Alethia Prince Keatley	71	<i>Ann Arbor</i>
Edith Wallace Keatley	98	<i>Ann Arbor</i>
Mabel Alice Kebler		<i>Washington, Ill.</i>
Edward Joseph Keefe	25	<i>Detroit</i>
Harther Lewis Keim, m	64	<i>Steeleton, Pa.</i>
Horton Keiser	57	<i>Pomeroy, O.</i>
†Carl Adolph Keller, I	30	<i>Cleveland, O.</i>
Robert Leon Kellett	66	<i>Coldwater</i>
Anita Marie Kelley		<i>Niagara Falls, Ontario</i>
Dean Curtis Kellogg	103	<i>Saginaw</i>
Joseph Patrick Kelly	30	<i>Rock Island, Ill.</i>

Nathan Beal Kelly	18
Thomas Walter Kelly	30
Ruth Cornelia Kelsey	
Myrtle Hildred Kemerer	60
Bernard William Kemper	22
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Ivan Arthur Kenaga	93
Carrie Hart Kendall	90
Charles Lyman Kendrick	60
Elizabeth May Kennedy	30
Harold Lang Kennedy, m	61
Hattie Mae Kennelly	
Francis Earl Kenney	
Ethel Alma Kenyon	86
Leo William Kenyon	91
James Alexander Kerns	56
Harry Watt Kerr	34
Rollin Andrew Kerr	
Margarite Mary Kervin	
†Gerald Lea Kesler, ea	15
Katharine Ketchum	
Kenneth Scofield Keyes	
Ralph Francis Khuen	63
Charles Iden Kidd	
Raymond Samuel Kidder	71
Choa Chic Kie	
Russell Donald Kilborn	72
Marjorie Kilbury	
Margaret Osgood Kilby	30
Reuben Bramlet Kilgore	
Edith Estelle Kimmel	
Victor Francis Kinch	30
Esther Elizabeth King	88
Helen King	56
Paul Zedoch King	
Lyle Boyle Kingery, m	94
Eugene Dexter Kirkby	
George Oliver Kirkendall	88
Bernard Lee Kitchin	90
Ulysses Silas Kivel	26
Frederick Augustus Klann	
Francis Julian Kleeman	
Ephraim Klein	30
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John Rutter Kneebone	67
Blanche Gale Kneeland	

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Anna Lora Knevels		<i>Corey</i>
Luella Knight		<i>Wheaton, Ill.</i>
Alma Marie Knoepp	49	<i>Pittsburg, Pa.</i>
Emma Elizabeth Knoepp	22	<i>Pittsburg, Pa.</i>
Edward Knuff		<i>Johnstown, Pa.</i>
Sophie Matilda Barbara Koch	95	<i>Ann Arbor</i>
Theodore Joseph Koenig		<i>Buffalo, N. Y.</i>
Arthur William Kohler	102	<i>Lansing</i>
Eric Louis Kohler	101	<i>Owosso</i>
Frank Frederick Kolbe	92	<i>Ann Arbor</i>
Alton Lester Kolpien		<i>Dunkirk, N. Y.</i>
Mildred Marshall Koonce	58	<i>Washington, D. C.</i>
Patrick Duffy Koontz	95	<i>Charleston, W. Va.</i>
Garabed Hagop Kooyumjian, m	76	<i>Petoskey</i>
Andrew Royal Kopp		<i>Moline, Ill.</i>
Harold Fred Korn		<i>Glenwood Springs, Colo.</i>
Elisabeth Bertha Koslowsky	88	<i>Jackson</i>
Lena Jessamine Krakau	80	<i>Syracuse, N. Y.</i>
†Albert John Kranz, l	38	<i>Toledo, O.</i>
Ernest Stephen Kratzet		<i>Detroit</i>
Ruth Emma Kreger	30	<i>Wyandotte</i>
Henrietta Vaughan Kremer	60	<i>Grand Rapids, Minn.</i>
Otto Theodor Kreuser		<i>Mount Vernon, N. Y.</i>
William Frederick Kroener		<i>Orange, Cal.</i>
Bernice Katherine Krueger		<i>Toledo, O.</i>
Helen Louise Krueger		<i>Toledo, O.</i>
Paul Elisha Kuhl		<i>Chelsea</i>
Kenneth Kuhn	92	<i>Gregory</i>
Neil Kunselman		<i>Endeavor, Pa.</i>
Louis Aaron Kustin, m	61	<i>Cleveland, O.</i>
George Vance Labadie		<i>Caney, Kans.</i>
Harold Milton Lacy	61	<i>Warren, Pa.</i>
Roy Lee Laird, m	69	<i>Spokane, Wash.</i>
Frances Josephine Lakin	90	<i>Oak Park, Ill.</i>
Norman Oscar LaMarche	29	<i>Richmond</i>
George Washington Lambert	30	<i>Vermilion, O.</i>
Beatrice Gjembs Lambrecht	31	<i>Minneapolis, Minn.</i>
Ralph Burt Lance	85	<i>Mount Pleasant</i>
George Elliott Landis		<i>South Brownsville, Pa.</i>
Henry Knowlton Lane	62	<i>Ann Arbor</i>
Chester Henry Lang	57	<i>Erie, Pa.</i>
Anthony Henry Lange, m	90	<i>Detroit</i>
Herbert Carl Lange	30	<i>Dayton, O.</i>
Norbert Adolph Lange	63	<i>Sandusky, O.</i>
Robert Russell Langenstein		<i>Freeport, Ill.</i>
Katreena Stewart Langford	S	<i>Ann Arbor</i>
Stephen David Lankester	16	<i>Grand Rapids</i>
Lawrence Dominic Larke		<i>Rogers</i>

Leonard Benjamin Larson
 Carl Downey LaRue 60
 George Edward Laska 27
 Ludwig Lasko
 Della Christine Laubengayer
 Walter Carl Laubengayer 87
 William Marcellenus Laux 30
 Myer Lavine
 Donald Emery Lawrence 22
 Herbert Leigh Lawrence 52
 Thomas John LeBlanc 30
 Julius Joseph Lechner 91
 Chineeman Yu Lee
 Helen Bridges Lee 13
 Vernon Templeton Lee
 James R. Leece 46
 Ray Victor Leffler 69
 Charles Everett LeFurge 88
 Albert Thomas Lehman
 Claude Thomas Leighton 22
 Charles Hermon Lemmon
 Florence Kiefer Lenfestey
 Gladys Soulier Lenfestey 62
 Ruth Harriett Lenzner 24
 J. Cecil Leonard
 Marian Josephine Leonard
 Selma Esther Leopold 94
 Frank James Lerch 85
 Harold Raymond Leslie
 R. Harry Leslie
 Warren Leslie
 Abraham Jacob Levin 15
 Jacob Levin 62
 Morris Levinkind
 David Levinson
 Ging Lew 7
 Elnore F. Lewis
 Evangeline Lewis 87
 Harry Phyletus Lewis 56
 Ida Mae Lewis 30
 Mary Proctor Lewis 60
 Henry Allen Lichtig, m 91
 Howard Scott Liddell
 Maurice Joel Lieberthal 24
 Tsoong Ching Lieu, m 60
 Bing Yuwen Lin 75
 Selma Augusta Lindell 30
 John Francis Linehan 31
 John Irwin Lippincott 88

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Florence Mae Litchfield	60	<i>Williamston</i>
Irene Litchman		<i>Frankford, Pa.</i>
Oliver Benjamin Little		<i>Traverse City</i>
Dakuin Keetau Liu	67	<i>Shanghai, China</i>
Fung Yan Liu	34	<i>Canton, China</i>
Lloyd L. Livermore	56	<i>Quincy</i>
Alice Crocker Lloyd	58	<i>Ann Arbor</i>
Po Shue Lo	36	<i>Canton, China</i>
Arthur Jay Lockard		<i>Wellston, O.</i>
Thomas Frank Lockard		<i>Indiana, Pa.</i>
Floyd Edgar Lockhart	94	<i>Pueblo, Colo.</i>
Pearl Enid Lockhart		<i>Detroit</i>
Charles C. Lockwood	88	<i>South Lyon</i>
Beatrice Lucile Logan	89	<i>Cleveland, O.</i>
George Washington Logan	56	<i>Dexter</i>
Helen Kingsley Loman	90	<i>Philadelphia, Pa.</i>
Arthur Walter Long	58	<i>Wyandotte</i>
Margaret Ruth Long		<i>Detroit</i>
Albertine Grace Loomis		<i>Grand Rapids</i>
Marie Louise Loomis	105	<i>Grand Rapids</i>
Marjorie Juline Lord, m	62	<i>Montreat, N. C.</i>
George Herbert Loselle	58	<i>Wyandotte</i>
Ralph Robert Lounsbury	20	<i>Grand Rapids</i>
Anna Marie Love	60	<i>Fremont, O.</i>
Jean Lovejoy	90	<i>Litchfield</i>
Owen Lloyd Lovejoy	30	<i>Princeton, Ill.</i>
Philip Craven Lovejoy	32	<i>Ann Arbor</i>
Anna Louisa Lowden	111	<i>Jackson</i>
Charles Porter Lowes	34	<i>Grand Rapids</i>
Laura Ludington		<i>Detroit</i>
Ernest Carl Luebben	51	<i>Toledo, O.</i>
Herta Luellemann	86	<i>Saginaw</i>
Carroll Finster Lum	68	<i>Ann Arbor</i>
Rena Marguerite Lundell	58	<i>Cadillac</i>
Harry Lundgren	30	<i>Ironwood</i>
Hayden Rupert Luther	27	<i>New Kensington, Pa.</i>
Julio Luzunaris		<i>San Juan, P. R.</i>
George Vincent Lynch, m	60	<i>Winona, Minn.</i>
Mack Morgan Lynch		<i>Dawson, Ky.</i>
Mary Elizabeth Lynn		<i>Wabash, Ind.</i>
George Hale Lyon, Jr.		<i>Detroit</i>
Léonard Mason Lyons	24	<i>Kansas City, Mo.</i>
Stephen Henry Lytle	42	<i>Shelby</i>
Hugo George Maas		<i>Indianapolis, Ind.</i>
June Maas		<i>Battle Creek</i>
Marie Genevieve Maas		<i>Houghton</i>
Oscar William Maas	25	<i>Detroit</i>

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 Edith Rebecca Macauley 40
 Katherine Seeley MacBride 47
 Lavinia Gould MacBride
 Herbert Hoyt McCain S
 Pearl Julia McCain 28
 Hugh M. McCall 20
 LeRoy Alexander McCall
 Martin Edgar McCarty 30
 Hazel Kirk McCauley 18
 Reginald Sullivan McClinton
 Robert James McCloy
 Dudley Stockton McClure 23
 George McClure, m 60
 Archibald Irvine McColl
 Thomas Merlin McConkay
 Irene Virginia McCormick 94
 Fledia Grace McCreery 23
 Verna Isabel McCreery 63
 George Clayton McCrillus 115
 Frances Lowelda McCune 30
 Marie Jackquita McDermott 53
 Awey Elfleda Macdonald
 David Archibald Macdonald
 Grace Ethel McDonald 93
 Harold Charles McDonald
 Landis Duley McDowell, l 77
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 Christian Norvel Mack 30
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 Richard Moore McKean 30
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 Lawrence Alderman McKenny
 Edna Elizabeth MacKenzie 88
 Earl Baldwin McKinley 24

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Donald Claude MacLachlan		Milan
Myron McLaren, I	94	Chelsea
Daniel M. McLaughlin		Redford
Emery McLaughlin	104	Saginaw
Raymond Hills MacLeod		Grand Rapids
Genevieve Emily McLouth	91	Ann Arbor
Maurine McMahan		Crown Point, Ind.
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George Porter McMahan, Jr.	30	Detroit
Grace Zenaide McMillan	92	Detroit
Sherman Martin McNair	48	Brookhaven, Miss.
Jessie Amelia McNamara	56	Saint Ignace
Anne Macomber	89	Saginaw
Kenneth Chancellor McPherson		Deadwood, S. Dak.
Marion McPherson	60	Howell
Elizabeth May McRae	30	Houghton
Madeline McVoy	95	Minneapolis, Minn.
Arthur Paul Madden	107	Menominee
Helen Magee	94	Easton, Pa.
Edward Maguire	30	Detroit
Helen Elizabeth Mahon	92	Ann Arbor
Roe Johnson Maier	30	Montpelier, O.
Caryl Isabel Malcomson		Detroit
Helen Josephine Malcomson	56	Detroit
Byron Walter Malfroid	30	Houghton
Egon Lothar Paul Mallick		Detroit
Charles Edward Maloney		Arcadia, Wis.
Frank Reese Manahan	43	Camden, Del.
Thomas Muxlow Manchester		Sioux Falls, S. Dak.
Edna Anna Mann	88	Dowagiac
Lula Wolcott Mann	88	Williamston
Glenn Elliott Mapes	93	Beulah
Frederic Waldorf Marble	52	Billings, Mont.
Walter George Marburger	60	Callery, Pa.
Clarisse Eleonore Margantin	71	Grand Rapids
Arthur George Markham	26	Saginaw
Clarion Sydney Markham	58	Benton Harbor
Louise Florence Markley	63	Battle Creek
Charles Barber Marks, I	97	Detroit
Julian Barnett Marks, M	73	Oscoda
Grace Irene Marquedant	72	Grass Lake
Bertha Bruce Marsh	76	Manistee
Howard Roland Marsh	52	Jackson
Vena Ina Marsh		Detroit
Clement Hoover Marshall	30	Greenville, O.

Ethel Gene Marshall		<i>Detroit</i>
Albert Carl Martens	30	<i>Maywood, Ill.</i>
Earl Victor Martin	88	<i>Detroit</i>
Edwin John Martin	64	<i>Norway</i>
Elta Jay Martin	104	<i>Ann Arbor</i>
James Stuart Martin	75	<i>Shenandoah, Ia.</i>
Stephen Douglas Martin	61	<i>Chicago, Ill.</i>
Mary Benham Marvin	28	<i>Duluth, Minn.</i>
Delia Marx	91	<i>Detroit</i>
Milton David Marx	32	<i>Detroit</i>
Doris Gertrude Mason		<i>Ann Arbor</i>
Elizabeth Greene Mason	56	<i>Detroit</i>
Ralph Lawrence Mason		<i>Crawford, N. J.</i>
William Elmer Mathews	62	<i>Wanatah, Ind.</i>
Arthur Jacob Matteson	88	<i>Centerville, Pa.</i>
Frederic Carl Matthaei	92	<i>Detroit</i>
Jane Helen Mayer	65	<i>Grand Rapids</i>
Rose Mary Mayer	58	<i>Detroit</i>
Horace Sheldon Maynard		<i>Charlotte</i>
James Picands Maynard	S	<i>Marquette</i>
Ernest John Mead	38	<i>Geneva, Ill.</i>
Oscar Franklin Mead		<i>Detroit</i>
Ruth Emma Meakin	30	<i>Bay City</i>
Mildred Medalie	30	<i>Mancelona</i>
Wilbur Chapman Medill	30	<i>Steubenville, O.</i>
Paul John Meiser	61	<i>Detroit</i>
Esther Elizabeth Mellencamp	30	<i>Grass Lake</i>
Edith Marguerite Melvin		<i>Detroit</i>
Roe Adele Melvin	S	<i>Ann Arbor</i>
Mabel Ruth Menefee		<i>Ann Arbor</i>
Ruth Emmet Mensch	96	<i>Three Rivers</i>
Beatrice Merriam	100	<i>Detroit</i>
Lacey William Metcalf	23	<i>West Palm Beach, Fla.</i>
Arden Bruce Metcalfe	16	<i>Shelby, O.</i>
Carl Stuart Metzger	101	<i>Ionia</i>
Leon Daniel Metzger, I	94	<i>Idamar, Pa.</i>
Hugh Raymond Meyer, m	65	<i>Fowler</i>
William Fred Michalske	30	<i>Cleveland, O.</i>
Florence Knowlton Middaugh	70	<i>Jackson</i>
Bruce Jerome Miles	93	<i>Mason</i>
John William Hammond Miles		<i>Wellsville, O.</i>
Frank Gurnee Millard, I	94	<i>Corunna</i>
Carol Lodema Miller		<i>Sturgis</i>
Charles Edward Miller		<i>Roswell, N. Mex.</i>
Clarence Aldrich Miller		<i>Jackson</i>
Elroy John Miller	93	<i>Toledo, O.</i>
Gleed Miller	91	<i>Salt Lake City, Utah</i>
Harold Abiud Miller, m	28	<i>Lansing</i>
Harry Arthur Miller	69	<i>Monroe</i>

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Herman Lester Miller	48	Fennville
Margaret Augusta Miller		Briscoe, N. Y.
Mary Dorothea Miller	19	Ann Arbor
Maurice Clark Miller		Bay City
Rowland James Miller	30	Albion
Ruth Bertha Miller	56	Negaunee
Ruth Dorothea Miller	39	Ann Arbor
Thomas Jay Miller	96	Cincinnati, O.
Wilbur Kingsbury Miller	63	Owensboro, Ky.
Morris Askew Milligan	98	Bradford, Pa.
Carroll Crawford Mills	88	Benton Harbor
Maude Gertrude Mills	92	Grand Rapids
Walker Hill Mills		Decatur, Ill.
Raymond James Milroy		Detroit
Martin Fitch Miner		Three Oaks
Ethel Powlison Minnard	89	Hastings
Eugene Ashley Minor		Ypsilanti
Ethel Louise Mitchell	88	Harrisville
Carl Mitcheltree	62	Transfer, Pa.
Luis Raymond Moczo		San Juan, P. R.
Henry Moes		Zeeland
Martha Muriel Moffett		Flint
Edmund Christopher Mohr, m	63	Bay City
Edith Grace Moiles	63	Detroit
Paak San Mok	30	Canton, China
Lester Stock Moll	15	Detroit
Alphons Peter Momenie	60	Toledo, O.
Ronald Russell Monroe	63	Leon, Ia.
John Chalmers Montgomery, m	91	Coldwater
Evelyn Winifred Moore		Coldwater
Maleta Belle Moore	90	Dowagiac
Arginius Morales		Ponce, P. R.
Dorothy Morgan Moran	104	Ann Arbor
Charles Stillman Morgan	97	South Bend, Ind.
George Mark Moritz	63	Chicago, Ill.
Donald Manly Morrill	30	Big Rapids
George Neal Morrill		Ann Arbor
Jennie Evelyn Morris	66	Ann Arbor
Finley Austin Morrison	4	Iron River
Joe Wood Morrison	103	Ann Arbor
Mary Birnie Morrison	57	Detroit
Helen Roberts Morse	60	Ann Arbor
Howard Emrys Morse	30	Dillon, Mont.
Marie Philip Morse	91	Detroit
Marion Jerauld Morse		East Saugatuck
Mildred Meredith Morse		Ann Arbor
Virginia Beatrice Morse		Detroit
John Walker Morton, Jr.		Fort Smith, Ark.
Marcus Randall Morton		Plummer, Idaho

John Alroy Mosenfelder
 Leon Hammerschlag Moser
 Allen Watson Mothersill 69
 Lena Belle Mott 61
 Benjamin Snively Motter 30
 Frederick Carlisle Moyer
 Clara Henrietta Mueller 82
 Hortense Marie Mueller 69
 Trevor Samuel Muffitt 96
 William Clinton Mullendore, 1 93
 John Hulst Müller, m 60
 Victor Harris Mullett
 Edgar E. Harrison Mumford 16
 Arthur Francis Mummery
 Glenn Gaywaine Munn 94
 Marcia Rebecca Munsell 73
 Robert Burns Murchie
 Malcolm Dunlap Murdock
 Floyd Blaine Murphy 55
 George Ignatius Murphy 20
 Natalie Elizabeth Murphy 56
 Lee Murray 44
 Margaret Murray 54
 William Foley Murray 18
 Ray Leslie Muskutt 18
 Alexander Harrison Muzzall 60
 Howard Gray Muzzy
 Walker James Myers 86
 Isabel Bender Nairn
 Gentok Nakai 28
 Willis Dean Nance
 Marce Vassileff Nasteff
 Russell Hugh Neilsen, 1 93
 †Bonneville Lon Neis, 1 22
 †Charles Samuel Neithercut, 1 20
 †William Aaron Neithercut, 1 20
 Julius Nelkin 23
 Amy Laura Nelson
 Ivan J. Nelson 94
 Kittie Cornelia Nelson 90
 Frank Ford Nesbit
 Lola Elizabeth Nesbitt 88
 Conrad John Netting 58
 Katherine Elsie Newberg 89
 Kathryn Hartmann Newbirt 86
 Charles James Newell
 Richard Earle Newell
 William Merle Newell 4
 Howard Jones Newland 23

Davenport, Ia.
 Marcellus
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 Dowagiac
 Lima, O.
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 Highland Park
 Ann Arbor
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 Tacoma, Wash.
 Harbor Beach
 Marshall
 Detroit
 Norway
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 Ontonagon
 Santa Barbara, Cal.
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 Chicago, Ill.
 Fredonia, N. Y.
 West Branch
 Detroit
 Clare
 Clare
 Ann Arbor
 Omaha, Nebr.
 Alma
 Battle Creek
 Washington, D. C.
 Ishpeming
 Detroit
 Ludington
 Toledo, O.
 Detroit
 Keithsburg, Ill.
 Keithsburg, Ill.
 Benton Harbor

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Charles Thomas Newton	22		<i>Ypsilanti</i>
Daniel Bartlett Newton			<i>Salamanca, N. Y.</i>
Lula Marie Newton	56		<i>Ypsilanti</i>
Geraldine Louise Nichols			<i>Detroit</i>
Harry S. Nichols			<i>Birmingham</i>
Milton George Nicola	37		<i>Ravenna, O.</i>
Marjorie Hope Nicolson	97		<i>Detroit</i>
Niels Christian Nielsen	116		<i>Portland</i>
Walter Albert Niemann			<i>Hermansville</i>
William Niemann			<i>Hermansville</i>
Leonard William Nietor			<i>New Bremen, O.</i>
Leonard Edward Gustave Nippe	30		<i>Toledo, O.</i>
Reynold Rudolf Oswald Nippe			<i>Toledo, O.</i>
Ellen Victoria Nord	62		<i>Iron Mountain</i>
Donald Fulton North			<i>Anita, Pa.</i>
Norman Theodore North			<i>Alpena</i>
Emily Frances Northrup	27		<i>Pontiac</i>
Arthur Bernard Norton	30		<i>Ann Arbor</i>
Eleanor Victoria Norton	89		<i>Ann Arbor</i>
Neva Norton	60		<i>Little Valley, N. Y.</i>
Blenn Notley	77		<i>Vicksburg</i>
Frank Orel Novy			<i>Ann Arbor</i>
Mildred Nuechterlein	68		<i>Grand Rapids</i>
Walter Ellis Nye	26		<i>Holyoke, Mass.</i>
James Edwin Oberlin	30		<i>Mansfield, O.</i>
Harold Edmund O'Brien			<i>Rochester, N. Y.</i>
James Don O'Connor	30		<i>Johnstown, Pa.</i>
Martin Earl O'Connor, Jr.	30		<i>Kewanee, Ill.</i>
Nellie O'Connor			<i>Detroit</i>
Vincent John O'Connor, m	61		<i>Ottawa, Ill.</i>
Takatoshi Odachi	26		<i>Oisomachi, Zai, Japan</i>
Shelby Green Ogden			<i>Paris, Ill.</i>
Whitney Ogden	60		<i>Kansas City, Mo.</i>
James Harold O'Hara	61		<i>Manistique</i>
Jay Leslie O'Hara	62		<i>Ann Arbor</i>
Patrick Victor O'Hara	58		<i>Manistique</i>
Gerda Maria Okerlund	49		<i>Ann Arbor</i>
Russell Aaron Alger Oldfield, m	63		<i>Bay City</i>
Clara Isabel Hurlbut Oldrin	97		<i>Lakeville, Mass.</i>
Genevieve Elizabeth O'Leary	30		<i>Muskegon</i>
Helen O'Leary	54		<i>Saginaw</i>
John Jeremiah O'Leary, m	92		<i>Muskegon</i>
Symmes Francis Oliver	95		<i>Cincinnati, O.</i>
Frank Ira Olmstead	50		<i>Geneva, N. Y.</i>
Bertha Lorraine Olsen	58		<i>Ishpeming</i>
George Monroe Olsen			<i>Portland, Ore.</i>
Albert Olen Olson	58		<i>Titusville, Pa.</i>
Edward Gerard O'Neill	62		<i>Brooklyn, N. Y.</i>
Earl John Opal			<i>Hubbell</i>

Donald Hunter O'Rourke, <i>m</i>	59	Fort Wayne, Ind.
†Howard Oliver Orr, <i>l</i>	30	Circleville, O.
Charles Rufus Osborn	26	Tekonsha
Winfield Scott Osborn		Detroit
Earl Dorland Osborne		Petoskey
Leon Daniel Ostrander	38	Saint Thomas, Ont.
Ruth May Otte		Ann Arbor
Clarence Elmer Otter		Detroit
Kathryn Pauline Overman		Danville, Ill.
William Laurie Owen	90	Covington, Tenn.
Genevieve Ida Packard		Detroit
Florence Belle Paddock		Detroit
Margaret Caswell Page	65	Detroit
Edgar Russel Paige	30	Deckerville
Amos Frank Paley		Dubuque, Ia.
Albert Stevens Palmer	13	Detroit
Edwin Barbor Palmer		Detroit
George Culver Palmer		Ann Arbor
Ina Belle Palmer	92	Clinton
William Beresford Palmer, Jr.	48	Detroit
William Crane Palmer		El Dorado, Kans.
Earl Edward Pardee		Akron, O.
Fred Leigh Pardee		Little Rock, Ark.
Carl Emanuel Pardon	S	Ann Arbor
Elsa Pearl Pardon	S	Ann Arbor
Sadie Pardon	80	Ann Arbor
Albert Bates Parfet	22	Golden, Colo.
Ray Theodore Parfet		Golden, Colo.
Boyd Thomas Park	30	Salt Lake City, Utah
John Curtis Bundy Parker		Evanston, Ill.
Lee Norton Parker		Cleveland, O.
Rodney Allen Parker	30	Cleveland, O.
Wilford Edwin Parker	76	Perry
Elizabeth Colombe Parolini	30	Norway
Rachel Phebe Parrish	99	Benton Harbor
Frederick E. Parsons	41	Grand Rapids
John Purl Parsons, <i>m</i>	93	Boise, Idaho
Roy Madison Parsons	87	Ypsilanti
Evelyn Louise Partridge		East Rochester, N. Y.
Dorothy Elizabeth Paton		Ann Arbor
Robert Frederick Paton	64	Ypsilanti
William Andrew Paton	67	Ypsilanti
Clarence Knox Patterson		Pontiac
Helen Webb Patterson	30	Portland, Me.
Mae Magdalene Patterson		Lakewood, O.
Norvin LeRoy Patterson		Clinton, Ill.
*Ethelyn Williams Patton		Grand Rapids

* Died December 18, 1913.

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Elsie Marie Paul		Fort Wayne, Ind.
Alfred Charles Paull	27	Calumet
Harold Joseph Payette	60	Bedford
Warren Godfrey Payette	58	Bedford
Marion LeRoy Payne	30	Saginaw
Maud Hattie Payne	38	Detroit
Robert Ellsworth Payne	62	South Haven
Wilbur Blatchley Payne	92	Kalamazoo
Ora Brooks Peake	72	Portland
John Robert Pear		Saugatuck
William Armour Pearl	30	Shepardsville
Walker Peddicord	68	Portland, Ore.
Dorothy May Peet	62	Battle Creek
Howard Bolton Pelham	28	Jackson
Howard Pellegrum	30	Grand Haven
Nelson Pellegrum		Grand Haven
Charlotte Lenore Peoples	89	Edmore
Ardelle Freda Perkins		Ann Arbor
Harold Gordon Perkins	106	Norway
Mary Teresa Perkins		Toledo, O.
Hyman Lazarus Perlis		Toledo, O.
Ben Edwin Perry	60	Ann Arbor
James Edward Perry		Ann Arbor
Walter Perschbacher		Grand Rapids
Ferdinand Paul Petermann	30	Laurium
Philip Ernst Petermann	58	Laurium
Bernice Louise Peters	27	Charlotte
Moses Richelieu Franklin Peters		Detroit
Vine Burgess Peters	64	Charlotte
Henry William Petersen	58	East Chicago, Ind.
Reuben Peterson, Jr.	106	Ann Arbor
Carlos Harry Pfeiffer		Houghton
James Thomas Phalan	93	Rome, N. Y.
Howard Alexander Phelps	72	Detroit
Beulah Cornelia Phillips		Pontiac
Edward Ashley Phillips	93	Ann Arbor
Peter Oliver Phillips		Glendive, Mont.
Louise Catharine Pickard		Fort Wayne, Ind.
Margery Esther Pickard	29	Fort Wayne, Ind.
Walter Henry Pielemeier	30	Chelsea
Barnard Pierce, I	92	Lansing
Charles Stuart Pierce	25	Union City, Ind.
Frank Sumner Pierce		Oxford
Virginia Pierce	28	Lansing
Leila Lucile Pike	62	Traverse City
Fred Wesley Pilkington		Portland
Harm Albert Pilon	90	Grand Rapids
Mary Ann Pinkham	88	Ann Arbor
Julius Victor Pinnell	45	Indianapolis, Ind.

Nathan Earl Pinney 30
 Ruie Pinney 72
 Paul Henry Piper, *m* 94
 Robert Lawrence Piper, Jr.
 Bessie Platto 30
 Phillips Kingsley Platts 30
 David Polasky 58
 Lisle Leo Pollock
 Isadore Polozker 30
 Harold Woodward Pomeroy 83
 Herman Pomper 38
 George Edwin Popkess
 Earle Morris Porter
 Elder Alexander Porter 32
 Kirk Harold Porter 96
 Elliot Curtis Porterfield
 Charlotte Louise Potter 30
 Robert Leon Potts 22
 Phyllis Seely Povah 15
 John Edmund Powell 103
 Florence Hazel Powers 30
 Ethel May Pratt 56
 LeRoy Alonzo Pratt 78
 Norman Hyde Pratt
 †Russell Honore Pray, *l*
 Forrest George Predmore 30
 Olive Prescott 60
 Phillips Brooks Preston
 Pearl Octavia Primeau
 Lawrence George Puchta
 Joseph Raymond Pugh
 Walter Sterling Pugh
 Bertha Crosland Pulford 26
 †Everett William Pulling, *e*
 Robert Emmet Purcell 92
 Mary Martha Purdy 75
 Ray Archie Purdy
 Warren Charles Putnam 56
 Stanley Edison Putney
 Frank David Quail 26
 Elmer Carl Quandt 30
 Florence Katherine Quinlan 59
 Cyril Joseph Quinn 97
 Louis William Rabe 59
 Harry Rabinowitz, *l* 92
 Gladys Lou Race 88
 Katherine Angie Rader
 Clare Ralya 22
 Lewis Stephen Ramsdell

Ann Arbor
 Ann Arbor
 Alamo
 Tyrone, Pa.
 Ishpeming
 Fort Pierce, Fla.
 Kalamazoo
 Decatur
 Detroit
 Kalamazoo
 Wilmette, Ill.
 East Saint Louis, Ill.
 Shelbyville, Ind.
 Greensburg, Ind.
 Waukegan, Ill.
 Detroit
 Hastings
 Greensburg, Pa.
 Detroit
 Detroit
 Grand Rapids
 Ann Arbor
 Armada
 Buenos Aires, Argentina
 Kansas City, Mo.
 Holly
 Mount Clemens
 Ionia
 Northport
 Cincinnati, O.
 Attica, Ind.
 Utica, N. Y.
 Detroit
 Windsor, Ontario
 Shamokin, Pa.
 Crafton, Pa.
 Brainerd, Minn.
 Oswego, N. Y.
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 Croswell
 Dearborn
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 Saginaw
 Payson, Ill.
 Eveleth, Minn.
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 McComb, O.
 Grand Haven
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Paul Vooheis Ramsdell	30	<i>Ann Arbor</i>
Franklin Peleg Randall		<i>Fort Wayne, Ind.</i>
Josephine H. Randall		<i>Ann Arbor</i>
LeRoy Dynes Randall	30	<i>Brooklyn, N. Y.</i>
Albert Wentworth Rankin	26	<i>Dover Center, Ont.</i>
Walter Edgar Rankin	30	<i>Pekin, Ill.</i>
Reno Paul Ransom		<i>Detroit</i>
Benjamin Rapport		<i>Pittsburg, Pa.</i>
Ogden Mill Rathert		<i>Indianapolis, Ind.</i>
Barbour Huston Rawls		<i>Coldwater</i>
Charles F. Reebs	63	<i>Colon</i>
Howard William Reed		<i>Rhineland, Wis.</i>
Mildred Marie Rees	61	<i>Coudersport, Pa.</i>
Gaal Alden Reese		<i>Crestline, O.</i>
Dora Reeves		<i>Stockbridge</i>
Catherine Mary Regan	38	<i>Ann Arbor</i>
Fred Lee Rehor		<i>Hastings</i>
Edgar Blaine Reichert	106	<i>Ann Arbor</i>
Helen Hannah Reichert		<i>Ann Arbor</i>
Clarence Augustus Reid		<i>Circleville, O.</i>
Everis Hayes Reid	26	<i>Hurley, Wis.</i>
Tom Corcoran Reid		<i>Detroit</i>
Catherine Farrand Reighard	56	<i>Ann Arbor</i>
Lewis Charles Reimann	64	<i>Iron River</i>
Roy Eugene Reindel	63	<i>Detroit</i>
Louis Joseph Reisch		<i>Springfield, Ill.</i>
Raymond Frederick Reitter		<i>Saginaw</i>
Ethel Adell Rennells	58	<i>Grand Rapids</i>
Margie Lucile Rennie	92	<i>Ann Arbor</i>
Karl Renz	30	<i>Toledo, O.</i>
Lewis Gottlieb Reutter	30	<i>Lansing</i>
Daniel Ignatius Clyde Reynolds	62	<i>Ann Arbor</i>
Elizabeth Reynolds	93	<i>Potsdam, N. Y.</i>
Floyd Otto Reynolds	30	<i>Croswell</i>
Grace Louise Reynolds	67	<i>Manistee</i>
Margaret Ruth Reynolds		<i>Ann Arbor</i>
Paul Howard Reynolds	18	<i>Dundee</i>
Frances Rhoades	92	<i>Ann Arbor</i>
Emma Edna Rhodehamel	31	<i>Indianapolis, Ind.</i>
Adolphe Lemuel Rice	60	<i>Orangeburg, S. C.</i>
Esther Emalyn Rice	89	<i>Saginaw</i>
Harry Ralph Rice	53	<i>Croswell</i>
John Kirkland Rice		<i>Alexandria, Minn.</i>
Lawrence Ascroft Rice		<i>Oak Park, Ill.</i>
Jesse Sonenberg Rich		<i>Saginaw</i>
Harry Lloyd Richards	22	<i>Houghton</i>
Lawrence Frayne Richardson	26	<i>Newberry</i>
Lee King Richardson		<i>Alpena</i>
Ralph Kirby Richardson		<i>Rochester, N. Y.</i>

Joseph Schober Richtig 26
 Leonard Moos Rieser 95
 Oliver Riggle 30
 Ellen Earle Riggs 99
 Genevieve Lyle Riggs 75
 Aaron Dudley Riker
 Walter Hamilton Rising
 Isabelle Rizer 89
 Roy Kenneth Roadruck 62
 Hunter Savidge Robbins 61
 Evelyn Hortense Roberts 60
 Florence Jean Roberts 34
 Sinton Tracy Roberts
 Grace Marian Robertson 62
 Rex Phillips Robertson 92
 Tom Howard Robertson 30
 Alexander Wilford Robinson 30
 Doris Harriott Robinson 61
 Hester Hopkins Robinson 91
 Margaret Waddell Robinson 18
 Mary Ethelwyn Robinson 95
 Sadie Fannie Robinson 67
 Standish Denham Robinson 34
 Orryl Samuel Robles
 Antoinette Cornelia Robson 70
 Emma Louise Robson 87
 Helen Grace Robson
 Charles Frederic Roche
 Donald Coumer Rockwell 60
 Robert Gordon Rodkey 91
 Juan Rodriguez 53
 Clara Goldsmith Roe 69
 Arthur Carl Roediger 15
 Clayton Condion Roehm 30
 Dorothy May Roehm 68
 Evelyn Grace Roehm 65
 Lawrence Stevens Roehm 30
 Winifred Ida Roehm
 Howard Dykema Roelofs 60
 James Speed Rogers 90
 Alvin Reuben Roggy 92
 Franklin Herman Rohrs 67
 Elgie Carl Rolfe 86
 Dominick Edward Romano 60
 Julius Pabe Romein
 Ethel Agatha Rommel
 Marie Beatrice Ronan 56
 Royal Davenport Rood
 Curtis Levern Roop 90

Iron Mountain
 Chicago, Ill.
 Freewater, Ore.
 Ann Arbor
 Ann Arbor
 Pontiac
 Corning, N. Y.
 Washington, D. C.
 Morocco, Ind.
 Grand Haven
 Manistee
 Superior, Wis.
 Clarks Green, Pa.
 Mount Clemens
 Pasadena, Cal.
 Hillsdale
 Great Falls, Mont.
 Grand Rapids
 La Junta, Colo.
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 East Lansing
 Jackson
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 Bay City
 Kalamazoo
 Mahaffey, Pa.
 Manati, P. R.
 Flushing
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 Washington, Ill.
 Ann Arbor
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 Ann Arbor
 Marshall
 Ann Arbor
 Bucyrus, O.

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Evelyn Roos	92	<i>Manistique</i>
Gertrude Weber Roos	26	<i>Manistique</i>
Marie Josephine Root	89	<i>Kalamazoo</i>
Reno Rayner Root		<i>Lansing</i>
Harvey Mapes Rosa	80	<i>Wheeler</i>
Gerald Rosenbaum		<i>Kalamazoo</i>
Lester Frohsin Rosenbaum	90	<i>Kalamazoo</i>
Samuel Edward Rosenfield	22	<i>Akron, O.</i>
Bernard Rosenthal	26	<i>Wilkes Barre, Pa.</i>
David Theodore Rosenthal	30	<i>East Chicago, Ind.</i>
Albert Frazier Ross	25	<i>Kansas City, Mo.</i>
Charles Howard Ross	30	<i>Troy, O.</i>
Chester Holbert Ross	44	<i>Tyler Hill, Pa.</i>
Earl Alexander Ross	56	<i>Marquette</i>
Raymond Sylvester Ross		<i>Ann Arbor</i>
Elisabeth Celestine Roth		<i>Göttingen, Germany</i>
Ernest Charles Roth	57	<i>Peru, Ill.</i>
Stella Rosa Roth	93	<i>Ann Arbor</i>
Glenwood Washington Rouse		<i>Kent, O.</i>
Arthur Harrison Rowe	30	<i>Orange, N. J.</i>
Genevieve Gladys Rowe		<i>Calumet</i>
Frank Leslie Rowland	88	<i>Franklinville, N. Y.</i>
Edward James Roxbury		<i>Eckerman</i>
Leola Edna Royce	30	<i>Ann Arbor</i>
Lorne Weldon Royce		<i>Ann Arbor</i>
Gladys Ruble		<i>Fairmount, Minn.</i>
Turner McKinley Rudesill		<i>Rapid City, S. Dak.</i>
Louis Garfield Rudolph	23	<i>Pueblo, Colo.</i>
Ernest Albert Paul Ruedemann	63	<i>Albany, N. Y.</i>
Rudolph Hermann Ruedemann, m	62	<i>Albany, N. Y.</i>
Henry Carl Rummel, l	102	<i>LaPorte, Ind.</i>
Alice Amy Rumsey	104	<i>Ann Arbor</i>
Edward Fred Runge	30	<i>Detroit</i>
James Floyd Runner, m	99	<i>Grand Rapids</i>
Russell Alexander Runyan	30	<i>Habor Springs</i>
Leslie Henry Rushbrook	25	<i>East Aurora, N. Y.</i>
Clara Belle Russell	80	<i>Hadley, N. Y.</i>
Frances Irene Russell		<i>Ann Arbor</i>
Francis Thayer Russell	58	<i>Grand Rapids</i>
Jerome William Russell		<i>Ishpeming</i>
Raymond Henry Saal		<i>New Orleans, La.</i>
Hope Sabin	96	<i>Sault Ste. Marie</i>
Edward Arthur Sachs		<i>Holyoke, Mass.</i>
Raymond Kenneth St. Clair		<i>Saint Joseph</i>
James Harvey Sallee, l	92	<i>Covington, Ky.</i>
John Einar Sanders		<i>Bisbee, Ariz.</i>
†Sterling Skillman Sanford, e		<i>Mount Clemens</i>
Donald McMorris Sarbaugh	29	<i>Goshen, Ind.</i>
Ellen Maude Sargeant	27	<i>Oak Park, Ill.</i>

Theodore Spaulding Sargent		<i>Hutchinson, Kans.</i>
Melvin Harold Saur 30		<i>Kent City</i>
Arthur Joseph Savard 30		<i>Waterbury, Conn.</i>
Thomas Mitchell Sawyer 18		<i>Hillsdale</i>
Cortlandt Whitehead Sayres 103		<i>Detroit</i>
William Walter Schatzkin		<i>New York, N. Y.</i>
Lucille Henrietta Scheid 72		<i>Kalamazoo</i>
Harry Simeon Scheinman		<i>Detroit</i>
Ephraim Harold Schetzer		<i>Lansing</i>
Eula Vivien Schlaack 105		<i>Birmingham</i>
Edward Henry Schlegel, m 74		<i>Fort Wayne, Ind.</i>
Meyer Alton Schlissel		<i>Detroit</i>
Julius Schlotthauer 93		<i>Chicago, Ill.</i>
Edgar Harold Schmidt 74		<i>Detroit</i>
Paul Frederick Schmidt		<i>Louisville, Ky.</i>
Herbert Nicolaus Schmidt 39		<i>Grand Rapids</i>
Albert John Schmitzler		<i>Mansfield, O.</i>
Arthur Edward Schneider 97		<i>Ironwood</i>
Philip Schnur 44		<i>Glencoe, Ill.</i>
Katherine Marie Schoenfeld 78		<i>Westfield, N. Y.</i>
Mildred Schorman		<i>Duke Center, Pa.</i>
William Schreiber 89		<i>Michigan City, Ind.</i>
Werner William Schroeder, l 100		<i>Kankakee, Ill.</i>
Leah Marie Schueren 32		<i>Detroit</i>
Edwin William Schultz, m 91		<i>Krupp, Wash.</i>
Ellis Jacob Schultz 36		<i>Ann Arbor</i>
Ewald George Willie Schulz		<i>Menominee</i>
Edna Lorene Schumacher 27		<i>Ann Arbor</i>
Claude William Schutter		<i>Ann Arbor</i>
Emilie Charlotte Schwartz 32		<i>Detroit</i>
Ottomar Daniel Schwartz		<i>Niagara Falls, N. Y.</i>
Elsa Marcella Schweitzberger 89		<i>Detroit</i>
Florence Helena Scott 56		<i>Lowell</i>
Juan Stuart Scott 92		<i>Hancock</i>
Marion Lind Scott 40		<i>Ann Arbor</i>
Chancy Sabine Seabrook		<i>Dayton, O.</i>
Claude James Seehorn 30		<i>Spokane, Wash.</i>
James Bradford Seeley, m		<i>Detroit</i>
Howard Francis Seely 62		<i>Ann Arbor</i>
Wanda Marie Seemann 92		<i>Denver, Colo.</i>
Gertrude Seifert		<i>San Diego, Cal.</i>
Vera Freda Seigworth		<i>Lickingville, Pa.</i>
Elsie Caroline Seitz 91		<i>Benton Harbor</i>
Cloyd Vernon Sellers		<i>Bartlesville, Okla.</i>
Ruth Leota Senff 30		<i>Detroit</i>
Bessie Lillian Servis 48		<i>Saint Joseph</i>
Donald Wesley Sessions		<i>Lansing</i>
Myrtie Marguerite Sessions		<i>Ann Arbor</i>
Howard Holland Seward 91		<i>Worcester, Mass.</i>

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Wilson Manly Shafer	32	<i>Brockport, N. Y.</i>
Loren William Shaffer, <i>m</i>	68	<i>Ligonier, Pa.</i>
Homer Christopher Shaffmaster	90	<i>Bronson</i>
Clarence Evans Shaffner	86	<i>Pinegrove, Pa.</i>
Will Shafroth, <i>l</i>	98	<i>Denver, Colo.</i>
John Elmer Shambach	88	<i>Espy, Pa.</i>
Samuel Shapero, <i>l</i>	98	<i>Bay City</i>
Owen Thomas Sharkey		<i>Johnstown, Pa.</i>
Jean MacNeill Sharpe	100	<i>Saginaw</i>
Ora Evelyn Sharpe	30	<i>Ann Arbor</i>
Charles LeVere Shattuck		<i>Corning, N. Y.</i>
George A. Shaw	32	<i>Eldorado, Ill.</i>
Abigail Roe Shay	51	<i>Harbor Springs</i>
Katheryn Henderson Shay		<i>Harbor Springs</i>
Alice Louise Sheen	4	<i>Detroit</i>
Vernon Charles Sheffield	89	<i>Chicago, Ill.</i>
John Albert Sheldon	30	<i>Plainwell</i>
Reuben Wilson Shelley		<i>Newfane, N. Y.</i>
Florence Mabelle Shelly	92	<i>Three Rivers</i>
Malcolm Edgar Sheltraw		<i>Saginaw</i>
Winnafred Julia Shepard	85	<i>White Hall, Ill.</i>
Edward Hudson Shepard		<i>Charlotte</i>
Clarence J. Sherff	90	<i>Flint</i>
Harold John Sherman		<i>Toledo, O.</i>
Edna Marguerite Shilling	90	<i>Nashville</i>
Olga Emeline Shinkman		<i>Grand Rapids</i>
Edmund Leo Shinnick		<i>Kewaunee, Wis.</i>
Caleb Glen Shipley	21	<i>Petersburg, Ill.</i>
Sidney Jerome Shipman		<i>Hastings</i>
Samuel Herman Shulkin	30	<i>Sioux City, Ia.</i>
Earl Robert Shull		<i>Streator, Ill.</i>
Faye Erma Shurte	87	<i>Ann Arbor</i>
Clarence Ivan Shutes	30	<i>Schoolcraft</i>
Harold William Shutter, <i>m</i>	92	<i>Grand Rapids</i>
Mina Alice Sievert	30	<i>Saint Johns</i>
Kimber Cornelius Sigler		<i>Gothenburg, Nebr.</i>
Meyer Sikov		<i>Pittsburgh, Pa.</i>
Russell Brayley Silsby	62	<i>Gasport, N. Y.</i>
Roy Silverman	24	<i>Grand Rapids</i>
Grace Ingersoll Simmons	91	<i>Marshall</i>
Joseph Edward Simmons		<i>Frankfort</i>
Ralph Adelbert Simons		<i>Saint Joseph</i>
Anna Leah Simson	60	<i>Tonawanda, N. Y.</i>
Charlotte Berry Sites	32	<i>Fort Wayne, Ind.</i>
John Wesley Sitler	98	<i>Leighton, Pa.</i>
Ernest Burton Skaggs	29	<i>Ottawa, Ill.</i>
Arthur Ronald Skiles	49	<i>Chicago, Ill.</i>
William Ewart Skillen	59	<i>Iron Mountain</i>

Cecil Skinner 20
 William Clare Skinner
 Margaret Skow
 Ellis Dwinnell Slater
 Karel Rolland Slatmyer
 Samuel Jacob Slavens
 Charles Matthias Sleder
 Frederick Vernon Slocum 65
 Carlton Fessenden Small
 Howard Lee Smallman, *m* 90
 Harold Hinsdill Smedley 25
 Alice Inglis Smith
 Arthur Leonard Smith 94
 Byron Earle Smith 101
 Clarence Frank Smith
 Clark Drake Smith
 Delos Grosvenor Smith
 Douglas Forrest Smith
 Edward Prescott Smith
 Ella May Smith 56
 Esther Fowler Smith 56
 George Burton Smith
 Harold Lewis Smith 32
 J. Frank Smith 72
 James Harold Smith 30
 John Glen Smith 52
 John Robert Smith
 LeRoy James Smith, *m* 62
 Lyle Haven Smith 52
 Mary Genevieve Smith 63
 Norman Louis Smith 93
 Park Hiram Smith 16
 Read Smith
 †Robert Elgar Laurie Smith, *e*
 Ross Huston Smith 56
 Sidney Jay Smith
 Stanley Phillips Smith
 Stella Louise Smith
 Willard Nelson Smith
 James Everett Snider 53
 Robert James Snider, Jr., *m* 94
 Gertrude Elizabeth Snow 62
 Florence Elisabeth Snyder 30
 Frank Righter Snyder 57
 Frederic William Soll 30
 Morris Berger Sonnenschein 29
 Will Cook Spain 91
 Warren Whittier Spangler 65
 Albert Elton Spaulding 66

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Jessie Isabel Spence	30	<i>Cass City</i>
Samuel Marlin Spence		<i>South Brownsville, Pa.</i>
Dorothy Bernice Spencer	85	<i>Oxford</i>
Eugene Joseph Spencer	91	<i>Salem</i>
Roscoe Donald Spencer, l	92	<i>Ann Arbor</i>
Rose Eugenia Spencer	59	<i>Chicago, Ill.</i>
Ruth Mae Spencer	30	<i>Morenci</i>
Margaret Spier	94	<i>Mount Clemens</i>
Herbert Jay Spinning		<i>Jackson</i>
Lawrence Lamar Splawn		<i>Dallas, Tex.</i>
Charles Martland Sporley		<i>Negaunee</i>
Lawrence Mason Sprague, l	93	<i>Ann Arbor</i>
Merrill Byron Sprague	23	<i>Chardon, O.</i>
Lois Converse Spraker	88	<i>Grand Rapids</i>
Harvey Henry Sprick	30	<i>Quincy, Ill.</i>
Harold Humphreys Springstun		<i>Pana, Ill.</i>
Rolland Willis Sprinkle		<i>Utica</i>
Lucile Ada Sproat	72	<i>Grand Rapids</i>
Theodore Louis Squier		<i>Battle Creek</i>
John Henry Staacke		<i>Duluth, Minn.</i>
Frank Williams John Stafford, m	90	<i>Detroit</i>
Clara Regina Stahl	56	<i>Culver, Ind.</i>
Norma Katherine Stahle	78	<i>Saint Louis, Mo.</i>
Mamie Florence Stahlem	70	<i>Valley City, N. Dak.</i>
Louise Sophia Stahmer	16	<i>Brooklyn, N. Y.</i>
Eleanor Nellis Stalker	18	<i>Detroit</i>
Clarence R. Stallings	60	<i>Andrews, Ind.</i>
Doris Stamats		<i>Toledo, O.</i>
Jere Long Stambaugh		<i>Youngstown, O.</i>
Ferris Charles Standiford		<i>Athens</i>
John Meddaugh Stanley	94	<i>Detroit</i>
Lura Marguerite Stanley	104	<i>Maumee, O.</i>
Sarah L'Estrange Stanley	30	<i>Detroit</i>
Beatrice Eva Stanton	56	<i>Belding</i>
Philip Brown Stapp	31	<i>Winona, Ill.</i>
Lester Charles Staudt	60	<i>Manitowoc, Wis.</i>
Ralph Stanley Stauffer, h	91	<i>Hagerstown, Md.</i>
Russell Bangs Stearns	30	<i>Kenilworth, Ill.</i>
Francis Burgoyne Stebbins		<i>Lansing</i>
Ethel Irene Steele		<i>Ann Arbor</i>
Joseph David Steers	49	<i>Ann Arbor</i>
Margaret Helen Steere		<i>Ann Arbor</i>
Ben Steers	31	<i>Kalamazoo</i>
James Russell Stein	30	<i>Detroit</i>
Floyd Green Steiner	25	<i>Mount Cory, O.</i>
Ruth Gertrude Stellwagen		<i>Ann Arbor</i>

Jacob Sterngold		Pittsburgh, Pa.
Walter Aloysius Steuer	60	Dayton, O.
George Howard Stevenson	30	Princeton, Ill.
Willard Arthur Stevenson		Rochester, Minn.
Bernice Stewart	63	Detroit
Margaret Stewart	30	Detroit
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Franklin Arthur Stiles		Binghamton, N. Y.
Clara Adele Stimson		Detroit
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William David Stimson	30	Mount Vernon, Ind.
Merle C. Stitt		Tarentum, Pa.
Albert Earl Stoll		Des Moines, Ia.
Charles Edward Stone	23	Saint Joseph
Charles Everett Stone	16	Akron, O.
Clifford Charles Stone	26	Benton Harbor
Harry Emerson Storms		Rutherford, N. J.
Arthur Francis Stott		Detroit
Ernest Charles Stott	56	Detroit
Marion Franklin Stowe	30	Ann Arbor
Marjorie Marie Stowell	58	Saint Johns
Claire LeRoy Straith, m	62	Detroit
Virginia Lorraine Straughn	32	Ann Arbor
Clarendon Earl Streeter		Bolivar, N. Y.
Alvin Strickler	90	Ypsilanti
Christina Ruth Stringer		Detroit
Eva Regina Stroh	63	Detroit
Norma Sophie Stroh	43	Detroit
Lawrence William Strong	93	Clymer, Pa.
Lucile Kathleen Strong	58	Ypsilanti
Irene Lucile Stroup	62	Grand Rapids
George William Struckmann	15	Berwyn, Ill.
Charles Barnes Stuart	58	Kenilworth, Ill.
Dorothy Battin Sturgeon	30	Pittsburgh, Pa.
John Perry Sturges	30	Cleveland, O.
Marchie Sturges	86	Ann Arbor
Hubert Brown Sturtevant		Delavan, Wis.
Robert Brown Sturtevant	94	Delavan, Wis.
Arthur W. Suberra	105	Sanborn, N. Y.
David Sugar		River Rouge
Victor Harrison Sugar	30	Detroit
Helen Frances Sullivan	17	Lima, O.
Marie Gertrude Sullivan	30	Muskegon
Edwin Friedrich Sunderman	57	New Bremen, O.
Margaret Lena Supé	30	Sault Ste. Marie
Frank Porter Surgenor	30	Rochester, N. Y.
John Stevenson Sutherland	52	Lansing
Harry Blair Sutter, l	94	Indiana, Pa.
Ellwood Paul Swan		Detroit

George Alfred Swanson		<i>Mankato, Minn.</i>
Elizabeth Adalyn Sweet	92	<i>Dowagiac</i>
John Elsworth Sweetnam		<i>Manistee</i>
John Singleton Switzer, Jr.	30	<i>Fort Crook, Nebr.</i>
Eug Su Sy	53	<i>Kimmoy, China.</i>
Edward Rodgers Sylvester		<i>Port Huron</i>
John Walter Symons	8	<i>Saginaw</i>
Harold Gladstone Tait	64	<i>Toledo, O.</i>
Henry Imre Takacs	30	<i>Waterford, Conn.</i>
Cyril Talbot		<i>Winnethka, Ill.</i>
Harold Chester Tallmadge, I	92	<i>Denver, Colo.</i>
Chee Ts'ng Tan	66	<i>Yuen-Gen, China</i>
George Richard Tandler, I	92	<i>Ann Arbor</i>
Harold Lorenzo Tandy	30	<i>Gardner, Mass.</i>
Chow Fong Tang	30	<i>Chepiang, China</i>
Sung Tang	74	<i>Changsha, China</i>
Robert Hudson Tannahill	76	<i>Detroit</i>
Henry Aaron Tape	97	<i>Milan</i>
William Mitchell Tawney		<i>Winona, Minn.</i>
Alice Taylor	67	<i>Ann Arbor</i>
Alruthus Ambush Taylor	53	<i>Garfield, D. C.</i>
Blair Taylor		<i>Indianapolis, Ind.</i>
John Wilson Taylor		<i>Pontiac</i>
Mildred Carrington Taylor	88	<i>Port Huron</i>
Harold Benson Teegarden		<i>Greenville, O.</i>
John Robert Tennison, Jr.		<i>Dallas, Tex.</i>
Nettie Jean Tennant	87	<i>Phoenix</i>
Leonard Francis Thalner		<i>Ironwood</i>
Oscar Balthaser Thiel, I	107	<i>Pigeon</i>
Edgar Raymond Theiss	26	<i>Portland, Me.</i>
George Ralph Thoeming		<i>Chicago Heights, Ill.</i>
William Bouton Thom	67	<i>Buffalo, Wyo.</i>
Edith Thomas	101	<i>Alden</i>
James William Thomas	42	<i>Detroit</i>
John Philip Thomas	114	<i>Ann Arbor</i>
Ruth Slocum Thomas	21	<i>Detroit</i>
Sidney Daniel Thomas		<i>Constantine</i>
Grace Harriet Rose Thomasma	33	<i>Grand Rapids</i>
Alfred Ross Thompson	30	<i>Rensselaer, Ind.</i>
Arthur Murray Thompson, m	63	<i>Grand Rapids</i>
George Sydney Thompson		<i>Kankakee, Ill.</i>
Josephine Louise Thompson	12	<i>Detroit</i>
Leland Stanford Thompson		<i>Toledo, O.</i>
Sarah Sophia Thompson	114	<i>Vulcan</i>
Vera Gertrude Thompson	70	<i>Ann Arbor</i>
Lillian Macmillan Thomson	92	<i>Detroit</i>
Roderick Buchanan Thomson		<i>Cadillac</i>
Grace Jane Thorne	72	<i>Fennville</i>
Joseph Scott Thornton	86	<i>Erie, Pa.</i>

Helen Eunice Thorp	12	Chicago, Ill.
John Thors	64	Bessemer
Richard Lionel Thorsch	38	Chicago, Ill.
Gerhard Emmanuel Thrun	56	Ann Arbor
Theodora Thurber	77	Holland
Harold Hazen Thurlby		Hudson
Gladys Katherina Thurman		Jackson
Norman Thrift Thurston		Toledo, O.
Frances Winifred Ticknor	93	Ann Arbor
Andrew Tiesenga		Holland
Cornelius Tiesenga	62	Holland
John Edward Tighe		Plymouth
Calvin Gale Tilton		Grant City, Mo.
Frederic Harris Timmerman	82	Ann Arbor
Frederick Homer Tinsman	30	Ann Arbor
Myrtle Adda Tobias	91	Battle Creek
Thomas Lawrence Tolan	30	Ironwood
Miriam Sarah Toles	30	Bisbee, Ariz.
Clifford Martin Toohy	30	Leslie
Frances Croft Topliffe		Perrysburg, O.
Irving Samuel Toplon		Lake Linden
Roy Herman Torbet	91	Detroit
Arthur Haviland Torrey	30	Chicago, Ill.
Helen Sue Tousley	88	Petoskey
Nathan Clarence Towne		Des Moines, Ia.
Lois Irma Townley	58	Ann Arbor
Myra Elida Towsley	92	Midland
Roice Ackerson Traphagan	39	Linden
Edith May Trattles	72	Constantine
Eugene Frederick Traub	30	Dubuque, Ia.
George White Traver		Kenilworth, Ill.
George Brainerd Travis	102	Big Rapids
Mildred Treat		Glastonbury, Conn.
Walter Joseph Tripp	88	Ann Arbor
Royal Grover Trisler	30	Greenwood, Ind.
Marshal Francis Troester		Detroit
Ruth Carolyn Trombley	30	Bay City
Milton Samuel Trost	-	Louisville, Ky.
Mary Eunice True	65	Ann Arbor
Lenore Pauline Trygland		Ishpeming
Ebba Teresia Trysell		Ann Arbor
Geta Lucile Tucker		South Haven
Harland Wynn Tucker		Portland, Ore.
Paul Olsen Tucker	26	Ann Arbor
Robert Ferdinand Tunnell, LL.B.		Edwardsville, Ill.
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Robert Williams Turner	30	Council Bluffs, Ia.
Ruth Jero Turner		Grand Rapids
Helen Elizabeth Tuthill	30	Detroit

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Maurice Reidy Twomey	14	Windsor, Ont.
Mary Muriel Tyson	30	Flora Dale, Pa.
Clarence Emil Ufer	29	Chicago, Ill.
Margarite Marie Ullrich	53	Des Moines, Ia.
Russell William Ullrich, <i>m</i>	60	Mount Clemens
David Harold Underwood	26	Ridgeway
Lilian Celestia Unger	97	Dundee
Grace Genevieve Upjohn		Kalamazoo
Ethel Vail		La Porte, Ind.
Ribot Jean Valiton	91	Deer Lodge, Mont.
Lawrence Worth VanAken		Newton, Kans.
Anna VanBuskirk	48	Kalamazoo
David Akton VanBuskirk		Kalamazoo
Kenneth William Vance	22	Erie, Pa.
Harry James Vandawarker	49	Ann Arbor
Gertrude Mabel Vanderhoof	75	Saginaw
Leonard Wesley Vandersall	63	Canton, O.
Helen Vanderveer	30	Milford, Ind.
Lindley Edward Vander Zalm	30	Grand Haven
Aris Laura Van Deusen	38	Battle Creek
Cornelius Elias Vande Velde	44	Dunkirk, N. Y.
Ralph VanDyk	60	Holland
Harry Fletcher Van Gorden		Emmetsburg, Ia.
Edgar Glen Van Kirk	90	Yellow Springs, O.
Vance John Van Loonen		Detroit
Andrew Van Lopik	55	Grand Haven
Herman Van Polen	61	Grand Rapids
Carl Van Raalte	14	Holland
John Darling VanSchoick		Jackson
Alice Harriett Vanselow		Holland
Glen VanSickle		Maple Rapids
Nathan Edward VanStone	107	Battle Creek
Vivian Arthur VanVolkenburgh	26	Detroit
Antonio Andris Vazquez		Guayama, P. R.
Francis Bulkley Vedder	55	Ann Arbor
Ray Gilbert Vicary	85	Saginaw
Eleanor Rosella Villers	75	Newark, N. J.
Eugene Judd Vincent	30	Rochester, N. Y.
Ralph Marean Vincent, <i>m</i>	60	Binghamton, N. Y.
†William Robert Vivian, Jr., <i>e</i>		Laurium
Margaret Gates Vogt		Chelsea
Ella Christine Vogt	90	Saginaw
Claude Edward Vollmayer	70	Toledo, O.
Arthur J. Vomberg		Charlotte
David Nelson Vore		West Milton, O.
Arthur Ralph Vorys		Lancaster, O.
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William Edward Votruba	30	
Henry Rex Waddell	28	
Thomas Antonio Wadden	91	
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Hugo Theo Wagenseil	34	
Mary Clewell Waggoner	55	
Helen Ward Wagner	94	
Elbridge Robinson Waite	32	
Frank Earl Waite	56	
Roy Judson Waite	94	
Albert J. Walcott	123	
Francis Edmund Walker		
Harriet King Walker		
Marjorie Louise Walker	105	
Roger Venning Walker	15	
Simon Aloysius Walkowiak, m	83	
Marian Claire Wallace	62	
Wilder Levern Walling	32	
Samuel Walper		
Edward Francis Walsh, Jr.		
Walter Richard Walsh	45	
William Cyril Walsh		
Fred Ralph Walter		
Frank Leonard Walters	26	
Kwang Yit Wang	38	
†David John Wanless, l	26	
Ruth Cecelia Wanstrom	84	
William Herman Wanzeck	24	
Earl Ward		
Eugene Austin Ward		
Leonard Ward		
Malcolm Seth Wardrop	89	
Dora Edith Ware	26	
Ralph Caldwell Warne	50	
Howard Maltby Warner	30	
Maxwell Dudley Warner		
Dorothea Warren		
Ralph Lane Warren		
Arthur Philip Warriner		
Blanche Carl Washburne	30	
Marguerite Gretchen Wasserman	30	
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Lester Elba Waterbury		
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Harry Henry Watkins	78	
John Rhoades Watkins	61	
Margaret Joan Watkins	105	
Myron Webster Watkins	68	

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Robert William Watson	30	Ludington
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George Watt, m	103	Barre, Vt.
Wallace Fish Watt		Barre, Vt.
Ray Bradshaw Watters	62	Akron, O.
Charles Pierre Wattles, l	95	Fowler, Ind.
Mae Harriet Watton		Holly
Walter Fletcher Watton, m	96	Fenton
Frances Amlar Way		Battle Creek
Catharine Mary Weadock	69	Lima, O.
Christian Ray Webb		Toledo, O.
Helen Louise Webb	57	Battle Creek
LeRoy Charles Webb		Holland Patent, N. Y.
Charles Clarence Webber	89	Ann Arbor
George Adelbert Webber	32	Detroit
Erwin William Weber	26	Detroit
LeRoy Weber		VanWert, O.
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Charles Weinberg	60	Elizabeth, N. J.
George Earl Weir	88	Ann Arbor
Sara Gladys Weir		Laurium
Frank Andrew Weiszer	23	Detroit
Robert Harrison Weitknecht	93	Buffalo, N. Y.
Leland Stanford Welbourn	30	Union City, Ind.
Alta Inez Welch	90	Marshall
Medard William Welch		Chicago, Ill.
Richard Enlow Welch		Chicago, Ill.
Charles Neil Weller		Ithaca
Charlotte Elizabeth Weller	56	Ithaca
Marion Roy Wellford	34	Memphis, Tenn.
Donald Marion Wells		Grand Rapids
Guy McNeill Wells	54	Brewster, O.
Ruth Jeanette Weltmann	47	Saint Joseph
James Wirth Wendling	63	Mansfield, O.
Christian N. Wenger	62	Caledonia
Catherine Dickson Wenley	32	Ann Arbor
Jemima Veitch Wenley	32	Ann Arbor
Carl Franklin Wensinger	30	Fremont, O.
Walter William Wensinger		Fremont, O.
Julius Feind Wernicke	94	Grand Rapids
Kenneth Charles Wesley		Adrian
Ruth Adele Westbrook	30	Battle Creek
Kenneth Neville Westerman	94	Adrian
Herbert Olander Westervelt, m	96	Ann Arbor
Renville Wheat, l	105	Ann Arbor
Howard Lemuel Wheaton	91	Charlotte
John Edwin Wheeler		Marion, Kans.

Leila Ethel Wheeler
 †Robert Irving Wheeler, *e* 15
 Gladys Louise Whelan
 Ingle Burgess Whinery
 Bessie Belle White 70
 Charles Sears White 104
 George Olin White
 Harold Kirk White
 Lenda Lucile White 59
 Leslie Aldous White
 Robert Sevey White 106
 Villiers Hudson White 90
 George Townsley Whitmarsh
 Clayton A. Whitney 101
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 Charles David Wiley
 †Horace Ewing Wilgus, *l* 27
 Ernestine Constance Wilhelm 62
 James Herbert Wilkins, Jr., *l* 97
 Morton Herbert Wilkinson 32
 Zeno Charles Wilkinson 28
 Gaillard Peter Willett 30
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 Arthur Guy Williams 95
 Blanche Hill Williams
 Dorothy Marie Williams
 Edgar Morgan Williams 4
 Fred Roger Williams 90
 Glenn Otis Williams
 Harriet Ripley Williams 92
 Mary Olivia Williams
 Max Edwin Williams 30
 Mildred Belle Williams 56
 William Wright Williams
 Winifred Ione Williams 90
 Frances Marianne Williamson 56
 Robert Ersig Williamson 30
 Geraldine Margaret Willis
 Sidney Morse Willis 47
 Charles William Willits 35
 Amy Mildred Willoughby 71

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Owen Burtch Winters	90	<i>Greenville, O.</i>
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Frank H. Wisner	41	<i>Charlotte</i>
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Joseph Gregory Wolber	39	<i>Detroit</i>
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George Coetz Wolfe	24	<i>Portland, Ore.</i>
†James Jacob Wolfe, I	20	<i>Lafayette, Ind.</i>
Laura Wolverton	62	<i>Batavia, Ill.</i>
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Edwin Ryan Akers				<i>Port Huron</i>
George Washington Akers	Mar	21		<i>Port Huron</i>
Spencer Thorndyke Alden	4			<i>Fort Wayne, Ind.</i>

* The letters following the names indicate the course or line of work the student has chosen to pursue; C, denoting civil engineering; M, mechanical engineering; E, electrical engineering; Ch, chemical engineering; Mar, marine engineering; BSE, bachelor of science in engineering; S, miscellaneous studies not leading to any degree. As students are not asked to make choice of course until the beginning of their second year, the absence of a letter indicates that the student is in his first year. The figures following the names indicate the number of hours of credit earned by the student prior to the beginning of the current academic year, 1913-1914, and completed without conditions, or credited to him on advanced standing. By an hour of work is meant the equivalent of one exercise a week for one semester. A dagger (†) preceding a student's name signifies that he also pursued studies for the whole part or part of the year, in some other Department of the University, indicated by an italic letter following the name, to-wit: a, Department of Literature, Science, and the Arts; m, Department of Medicine and Surgery; l, Department of Law; p, School of Pharmacy; h, Homoeopathic Medical College; d, College of Dental Surgery.

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Frederick Augustus Babcock	S			Ann Arbor
Reuben Erastus Babcock		14		Ann Arbor
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Carl Arthur Batcheller	4		<i>Olean, N. Y.</i>
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Merle Francis Bennett	E	31	<i>Detroit</i>
Evan Heber Benoy	C	50	<i>Owosso</i>
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Julian Sage Burrows			Saginaw
Victor Raymond Burton	C	146	Oak Harbor, O.
Thomas Hubbard Bushnell, Jr.	M	77	East Cleveland, O.
Irving Ditmars Buttler			New Brunswick, N. J.
Leland Henry Buxton			Detroit
Asa Glenn Cadwallader	E	29	Hastings
Ralph Howe Cady	C	33	Sault Ste. Marie
Walter Wilson Calkins	M	71	Petoskey
William Grandin Calkins	Ch	104	Ann Arbor
Elbert Fletcher Campbell		8	Plymouth
Glenn Erwin Campbell	Ch	39	Pontiac
Gordon Campbell			Detroit
Harry Linn Campbell	Ch	122	Alpena
Lawrence C. Campbell	Mar	75	Alpena
Lindsey Field Campbell	M	109	Detroit
William Wallace Candler	C	67	Detroit
Dwight Joseph Canfield			Mount Clemens
Willard Marion Cannan	C	73	Toledo, O.
Arne Theodard Carlborn		7	Ironwood
Harold Eugene Carlin	C	51	Greenville
Harry Ernest Carlson			Denver, Colo.
Albert Lawry Carpenter	M	38	Detroit
Noble Dexter Carpenter			Gaylord
John Primrose Carritte, Jr.	Ch	35	Detroit
Howard Leslie Carroll		4	Lockport, N. Y.
Charles Loomis Carter	C	49	Vicksburg

Richard John Carter	E	121	<i>Haskins, O.</i>
Charles Barnes Cartwright			<i>Detroit</i>
Horace Alfred Cartwright			<i>Oregon, Ill.</i>
Melvin Eldon Case	Mar	53	<i>Fenton</i>
William Jesse Case	M	59	<i>Detroit</i>
Walter Benton Casler	E	112	<i>Sault Ste. Marie</i>
Arthur Bishop Castle	C	35	<i>Constantine</i>
Ysaías Castro	4		<i>Fianguistenco, Mexico</i>
Harrison Henry Caswell	C	55	<i>Greenville</i>
Louis Edgar Cattell	Mar	75	<i>Detroit</i>
Andrew Francis Caughey			<i>Ann Arbor</i>
John Robert Caughey	Ch	119	<i>Ann Arbor</i>
Alfred Joseph Cayia	M	93	<i>Crystal Falls</i>
Lloyd Clayton Chambers	M	103	<i>Perrysburg, O.</i>
Ping Key Chan	E	53	<i>Hong Kong, China</i>
Ju Shen Chang	3		<i>Chekiang, China</i>
Ralph Edwin Chapin			<i>Ann Arbor</i>
Arnold Lawrence Charnley			<i>Ontonagon</i>
Elmer Bradford Chase			<i>Orion</i>
Russell Ludden Chase	E	20	<i>Denver, Colo.</i>
Fred Joseph Chatel	M	116	<i>Kearsarge</i>
George August Chatel	M	77	<i>Kearsarge</i>
Robert Dan Chatfield	M	33	<i>Ann Arbor</i>
Victor McKnight Chatfield	M	67	<i>Ann Arbor</i>
Phoo Hwa Chen	C	89	<i>Yunting, China</i>
Te Fen Chen	C	80	<i>Kashan, China</i>
Clarence Adelbert Cheney	M	76	<i>Detroit</i>
Gung Yi Cheng	Ch	68	<i>Soochow, China</i>
Carl Gilbert Christensen	E	27	<i>Negaunee</i>
George Walsh Christensen		16	<i>Grosse Pointe</i>
Harry Christiansen	C	29	<i>Manistee</i>
Ralph Edward Christman	Ch	108	<i>Monroe</i>
Curtis Richard Chynoweth			<i>Houghton</i>
George Henry Cibell	E	99	<i>Michigan City, Ind.</i>
Abner M. Clark	E	54	<i>Mount Sterling, Ill.</i>
Bert A. Clark	M	77	<i>Northville</i>
George William Clark	C	38	<i>Seattle, Wash.</i>
Irving Bowne Clark			<i>Utica, N. Y.</i>
John Finlay Clark	E	37	<i>Oklahoma City, Okla.</i>
†Willard Huntington Clark, a			<i>Rochester, N. Y.</i>
Arvine Nelson Clarke			<i>Scranton, Pa.</i>
Benjamin James Cleaver	E	21	<i>Ann Arbor</i>
Walter Joseph Clement	M	44	<i>New Hartford, N. Y.</i>
James Edward Clickner	E	113	<i>Dansville</i>
Charles Henry Clise	M	27	<i>Geneva, N. Y.</i>
John Hamilton Cochran	M	55	<i>Coloma</i>
William Earl Code	C	28	<i>Saginaw</i>
Sam Jacob Cohen	Ch	47	<i>Washington, D. C.</i>
†Samuel Cohen, a	15		<i>Rochester, N. Y.</i>

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Alfred Henry Cohn					Buffalo, N. Y.
Frederico Collazo	M	40			Manati, P. R.
George Collingwood	BSE	99			Holyoke, Mass.
Robert Wetmore Collins	S				Jacksonville, Fla.
James Lov Colt	Ch	27			Lancaster, N. Y.
Clarence Robert Conn	M	37			Detroit
Donald Deans Conn					Detroit
Percy Connell	S	20			Lupton
Edmond Wharton Conover	M	113			Coldwater
Abram Nathan Cook					Duluth, Minn.
Chauncey Ferris Cook, Jr.	M	114			Hillsdale
Donald Moore Cook	C	75			Grove
Ralph H. Cook					Traverse City
Ralph Payne Cook	M	16			Oswego, N. Y.
Wihfred Cook	C	127			Saginaw
Gordon Dale Cooke	C	34			Detroit
William Landon Cooke	Mar	37			Monroe
Harry Carman Coons	C	64			Findley, O.
Howard Griswold Cooper	M	56			Brockport, N. Y.
Stewart T. Cooper	E	12			Belmont
Henry Thomas Cope	M	116			Detroit
Robinson Donald Cope					New Orleans, La.
Malcolm David Corbin	S	8			Detroit
Horace Marvin Hoyt Corey	C	28			Chicago, Ill.
Robert Craig Corlett					Oak Park, Ill.
Dana Robert Cornell	M	24			Corunna
†Carson Augustus Cosgrove, a					Owosso
Maynard Giles Cosgrove		4			Sylvania, O.
James Russell Costello	C	44			Denver, Colo.
Carl Henry Cotter	C	35			Bay City
Holmes Asa Cottrell	M	69			Marine City
Charles Carroll Coult					Factoryville, Pa.
Raymond Hawkes Coulter					Detroit
Erwin Frank Coveney	C	97			Detroit
Artemas Ward Cowing					Jackson
Guy Roswell Cowing					Flint
Willard Newton Cowing	Ch	73			Jackson
†James Blodgett Craig, a	Ch	95			Detroit
Thomas Baker Craigie					Detroit
John Robert Thompson Craine	Ch	100			Altoona, Pa.
Lou Revere Crandall					Sylvania, O.
Sheldon Cyr Crane		4			Negaunee
George Hobart Crase	C	68			Trimountain
William Elon Crawford	E	111			Charlotte
Ira Stanley Crissman	M	28			Detroit
George Westley Crockatt					Sault Ste. Marie
Sabin Crocker	M	77			Mount Clemens
Charles Whitney Crosby	M	50			Ironwood
Arthur Harry Crosson	C	46			Hagerstown, Md.

Edgar Dean Crumpacker	C	23		<i>Hammond, Ind.</i>
Cornelius Whitlock Cuddeback	E	41		<i>Port Jervis, N. Y.</i>
Walter Clifton Cumming				<i>Port Huron</i>
Stanley Curtis	Mar	29		<i>Holland</i>
Guy Clarence Curtiss	C	44		<i>Detroit</i>
Ivan Norman Cuthbert	E	83		<i>Ann Arbor</i>
Harvey Donald Cutler	E	105		<i>Ionia</i>
Maxwell Blount Cutting				<i>Troy</i>
Leo Thornton Daggy	M	69		<i>Michigan City, Ind.</i>
James LaVerne Dailey	C	115		<i>Manistee</i>
Leonard Neil Dalby	Ch	110		<i>Mount Clemens</i>
Francis Monroe Dale	M	21		<i>Rochester, N. Y.</i>
David Samuel Dann				<i>Detroit</i>
Carl Resolved Daugherty	E	39		<i>Tiro, O.</i>
Harold Osborn Davidson	C	116		<i>Iron Mountain</i>
Jesse McKinley Davidson	Ch	69		<i>Mount Pleasant</i>
Norman Hart Davidson	M	32		<i>Iron Mountain</i>
Charles Crawford Davis				<i>Fenton</i>
Frank Robert Davis	C	89		<i>Detroit</i>
Leslie Kenneth Davis				<i>Romeo</i>
Robert Leland Davis				<i>Grand Rapids</i>
Stanley Pettee Davis				<i>Youngstown, O.</i>
Winfield Crittenden Davis				<i>Duluth, Minn.</i>
Raymond George Day				<i>Highland Park</i>
Watson Richard DeGowin	M	80		<i>Fort Covington, N. Y.</i>
Lorenzo de la Maza, C.E.	S	75		<i>Renaico, Chile</i>
<i>Santiago (Chile)</i>				
Leslie Edward Delf	E	70		<i>Calumet</i>
Llewellyn Miller Dellinger	E	44		<i>Kalamasoo</i>
Francisco del Valle	E	28		<i>San Juan, P. R.</i>
Manuel Angel del Valle	Ch	40		<i>San Juan, P. R.</i>
Edward John DePree	Ch	70		<i>Zeeland</i>
Clarence Charles Des Jardins	E	42		<i>Alpena</i>
Victor DesRoches	E	108		<i>Detroit</i>
Reuben Arthur Devos	C	103		<i>Milwaukee, Wis.</i>
George Cramer Dewey	Ch	26		<i>Ann Arbor</i>
Ralph Burbank Dibble	M	79		<i>Ann Arbor</i>
Vaughan Roy Dibble	E	70		<i>Fullerton, O.</i>
Allen August Dicke	M	108		<i>New Bremen, O.</i>
Louis Fred Dieterich	12			<i>Washington, D. C.</i>
Henry William Dieters				<i>Holland</i>
Edward John Dignan				<i>Youngstown, O.</i>
Charles Morgan Dill	C	96		<i>Ben Aron, Pa.</i>
Earnest Joseph Dillman	M	29		<i>Chayenne, Wyo.</i>
Robert Dillman	M	105		<i>Cheyenne, Wyo.</i>
Erwin Benjamin Dixn	Ch	21		<i>Bay City</i>
Russell Alger Dodge	C	33		<i>Whitmore Lake</i>
Selwyn Alexander Dodge				<i>Avoca</i>
Norman Leverette Dolph	E	72		<i>Cadillac</i>

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Harry Spurgeon Donald	C	61	<i>Kearsarge</i>
Lloyd Hamilton Donnell	M	77	<i>Ann Arbor</i>
Daniel Joseph Dougherty			<i>Erie, Pa.</i>
Gilbert Denison Douglas	C	68	<i>Grosse Ile</i>
Lorne Joseph Douglas	Ch	25	<i>Johannesburg</i>
Stratford Bradish Douglas	C	112	<i>Grosse Ile</i>
Peter Currie Downie			<i>Detroit</i>
Donald Mitchell Drake	C	25	<i>Ann Arbor</i>
Ernest Benjamin Drake	Ch	115	<i>Detroit</i>
Harcourt Colburn Drake	E	90	<i>Breckenridge</i>
Ora Alfred Dresser			<i>Lexington</i>
James Warren Driver			<i>Mason</i>
Leslie Allen Droman	M	18	<i>Lockport, N. Y.</i>
Stuart William Dubee	C	55	<i>Beloit, Wis.</i>
Francis Wheelock DuBois	C	123	<i>Washington, D. C.</i>
Ernest Elmer Dubry	M	113	<i>Sibley</i>
Davis Dudley	M	111	<i>Orange, N. J.</i>
DeWitt A. Dudley	C	65	<i>Jonesville</i>
Raymond Frederick Dunbrook		2	<i>Grand Rapids</i>
Merle Junius Duryea			<i>Saginaw</i>
Henry Post Dutton	E	130	<i>Holland</i>
Joseph Edwin Dyer, Jr.			<i>Washington, D. C.</i>
Morace Sylvester Easton		20	<i>Watervliet</i>
Stanley Harold Eaton			<i>Kalamazoo</i>
Lattelle Earl Ecker		4	<i>Lowell</i>
Ransom Miller Eckerson			<i>Akron, N. Y.</i>
Alfred Eckert	C	98	<i>Saginaw</i>
Lewis Watson Edison	C	69	<i>Grand Rapids</i>
Otto Ford Edward	C	107	<i>Sault Ste. Marie</i>
Frank Charles Eisenach		4	<i>Fremont</i>
Donald Goodwin Ellis	M	85	<i>Detroit</i>
Hiram Baldwin Ely			<i>Rutherford, N. J.</i>
Stanley Hayes Emerick		14	<i>Detroit</i>
Francis Jiroch Emmons		10	<i>Muskegon</i>
Samuel Ewart Emmons		14	<i>South Bend, Ind.</i>
Walter Thirlmore Emmons	M	90	<i>Ann Arbor</i>
George Henry Engel	E	110	<i>Kalamazoo</i>
Harry Chapman Engel	E	16	<i>Detroit</i>
John Henry Engel, Jr.			<i>Detroit</i>
Howard Austin Enos	E	69	<i>Jackson</i>
Harold Richard Erdman			<i>Grand Rapids</i>
Walter August Erley	E	109	<i>Detroit</i>
Ralph Dwight Ernest	E	106	<i>Yale</i>
Addison Ross Evans			<i>Chicago, Ill.</i>
Boyd Vincent Evans		4	<i>Ann Arbor</i>
Porter Henderson Evans	E	114	<i>Erie, Pa.</i>
Charles Austin Everett	M	38	<i>Watertown, N. Y.</i>
Frederic DeMond Everett	Ch	21	<i>Wyandotte</i>
Harry Franklin Farrell	E	111	<i>Elk Rapids</i>

William Joseph Farrell	M	107	Milford
Eugene Gould Fauntleroy	M	69	Geneva, Ill.
Robert Stanley Fead	M	57	Port Huron
Tsoong Fang Fead	Ch	61	Soochow, China
Rudolph George Felger	Ch	42	LaHarpe, Kans.
Stewart Livingstone Ferguson	M	107	Detroit
Joseph Gaston Ferrand	Ch	17	Detroit
John Hanford Ferris	C	52	Passaic, N. J.
Halouk Hussein Fikret	M	73	Constantinople, Turkey
John Wilbur Finkenstaedt	M	32	Bay City
James Frank Firestone	M	122	Ford City, Kans.
Erwin Fischer	Ch	117	Detroit
Earl Victor Fishburn	Ch	73	Edgewater, Colo.
Abram Fisher	C	62	Grand Rapids
George Edward Fisher			Greenville, Pa.
Harry Fisher	E	121	Grand Rapids
Clarence Turner Fishleigh			Chicago, Ill.
Louis Clarence Fisk	M	111	Detroit
Donald Marcus Flaitz			Kalamazoo
Hart Harris Fleming			Indianapolis, Ind.
Albert Charles Fletcher	M	110	Kalamazoo
Carlyle Stevenson Fliedner	M	133	Dayton, O.
Carl Hjalmar Flink	M	41	Ironwood
Norman St. John Flook	C	98	Dunkirk, N. Y.
Im Cheung Fok	Ch	107	Canton, China
Edwin Chester Foltz	Ch	76	Louisville, Ky.
Raymond Dietrich Foltz		4	Saint Joseph
John Willard Fonner		8	Union City
Leslie D. Ford	M	20	Caro
Chester Lawrence Michael Fordney	M	24	Saginaw
Harold Burtren Forsythe		4	Saginaw
Irwin Allen Fosse	C	28	Chicago, Ill.
Ival Gale Fowler	C	40	Ann Arbor
Edward Arthur Franzen			Flint
Alvah Blaker Frederick	M	109	Detroit
Simon Reynold Frederickson			Negaunee
Bert Clinton Freeman	C	65	Yale
Emil Frank Frey		6	Toledo, O.
Earl Clayton Fries		8	South Bend, Ind.
Chung Chio Fu	M	79	Yangchow, China
Charles Theodore Fuetterer	C	58	Akron, O.
Oscar Morris Funke	Ch	38	Detroit
Lyman Howard Funkey			Hancock
Albert Carl Gabriel		6	Owosso
Godfrey Gustave Gaiser	M	41	Cleveland, O.
Gonzalo Garcia	C	102	Botolan, P. I.
Andrew Gardella	E	68	Port Jervis, N. Y.
Dick Beckwith Gardner			Dowagiac
Herbert Alexander Garrison			Detroit

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Harold Kent Gatley	C	64	Portland, Me.
†Samuel Geisenberger, Jr., a			Natches, Miss.
Walter Clemens Gernt			Detroit
Andrew Gerry	C	33	Port Chester, N. Y.
Walter Pooley Geyer			Buffalo, N. Y.
Ralph Jewell Gibson	10		Laurium
Charles Bernhardt Gildemeister	E	32	Detroit
Claud Emmons Gill			Ypsilanti
Ernest Harvard Gillette	E	112	Savona, N. Y.
Willard Graham Gilson	M	103	Ogden, Utah
Elroy Arthur Giroux	E	55	Momence, Ill.
Willard Sherman Girvin	Ch	35	Buffalo, N. Y.
William Guy Given	C	41	Long Beach, Cal.
Srabion Vartan Givrigian	E	30	Sergaville, Armenia
Leo Bernard Gizewski	M	84	Cleveland, O.
Ralph Cedrie Glasier	E	72	Onaway
Emil Karl Goettel	Ch	54	Detroit
Alice Charlotte Goff	C	74	Ann Arbor
Martin Louis Goldstein	Mar	41	Saginaw
Robert Louis Gomom	E	112	Ann Arbor
Charles Henry Goodrich		4	Davison
George Nelson Goodrich			Detroit
Dean Jilbert Goodsole	E & M	137	Hancock
Albert Edward Goodwin	C	64	Cheboygan
Chester Arwin Gorham	C	71	Mount Pleasant
Patrick Clifford Graney	C	25	Mount Hope, W. Va.
Clarence Parsons Green	C	21	Cleveland, O.
†John Sidney Green, a		4	Saginaw
Morris Greenblatt	E	32	New London, Conn.
Clark Riggs Greene	E	73	Salem, O.
William Bert Greenfield	M	107	Cleveland, O.
Samuel Greenspahn			Chicago, Ill.
Harold Moore Gregory			Windsor, Ont.
Arthur Foote Grenell	E	33	La Grange, Ill.
Arthur Raynes Griffes	C	55	Ridgewood, N. J.
Daniel James Griffin			Holyoke, Mass.
Fred Rudolph Gross	E	49	Saline
Harold Edwin Groves	M	25	Ann Arbor
Humphrey Millet Grylls	M	33	Detroit
Russell Branch Guilbault	E	86	Hancock
Vincente Guillermet	C	25	San Juan, P. R.
Robert Dedlaf Gunther	S		Grand Rapids
Louis Jacob Gurevich	Ch	31	Washington, D. C.
Howard Lee Haag	C	20	Rockford
Mayo Addison Hadden	C	39	Holland
Joseph Nicholas Hadjisky	S	32	Sophia, Bulgaria
Laurence Burton Hadley	11		Chicago, Ill.
Robert Welch Hadley	E	44	Toledo, O.
Clarke Ueberhorst Haire	M	52	Boyer City

Eugene Michael Haley			
Lloyd Hamilton Hall	E	107	
Oliver Wendell Hall	M	71	
Russell Alger Hall	M	23	
Walter Charles Hall	E	66	
Frank James Halliday	C	47	
Peter Christensen Hammelef	C	33	
George Edward Hammond			
Dorothy Tilden Hanchett		26	
Wilbur Merrill Hankinson	C	72	
William Charles Hansen		8	
Carl Adolf Happold			
Brown Harding	E	114	
Joseph Allan Harlan	M	78	
John Frank Harning	E	79	
Thomas Stephan Harrington		10	
Clinton Page Harris	C	33	
Floyd Edward Harris	M	107	
Raymond Burton Harris	M	104	
Clarence Edwin Hart			
Wallace Hartley	E	20	
Louis Frederick Hartmann	E	112	
Clarence D. Hartsuff	M	24	
Aboul Hassan			
Edwin Conrad Hasse	C	120	
Baird Hastings			
Lloyd Rayburn Hatton			
Oscar Ernest Hauser		4	
Tom Daniel Hayes	M	104	
Ralph Allington Hayward		4	
Joseph Burton Headley	Mar	27	
Edward Charles Headman	C	29	
Atlas Joseph Hebert	M	105	
Arthur Ervin Hecker	M	30	
Harold Magnus Hedin	C	63	
Howard Edward Heilman	M	99	
Kenneth Warren Heinrich	Mar	31	
August Paul Heinze	C	96	
Hubert Messner Heitsch	C	20	
Arthur James Helfrich			
Carl Ernest Hellenberg	S		
Lewis Wellington Heller	M	73	
Walter Sheldon Helmer	E	60	
George Bernard Helmrich	M	75	
Floyd Harrison Helrigel	Ch	63	
Clarence Lesley Helsel	E	81	
Raymond Severin Hemmingsen	M	60	
William O'Brian Henderson	C	35	
Edwin Wilhelm Henne		4	

Rochester, N. Y.
 Akron, O.
 Denver, Colo.
 Blissfield
 Greenville
 Oneida, N. Y.
 Detroit
 Rockville, Conn.
 Ann Arbor
 Grand Rapids
 Pittsburg, Pa.
 Doniphan, Nebr.
 Buffalo, N. Y.
 Flint
 Detroit
 Denver, Colo.
 Alpena
 Flint
 Detroit
 Holyoke, Mass.
 Gobleville
 Grand Rapids
 Ann Arbor
 Shiraz, Persia
 Muskegon
 Indianapolis, Ind.
 Alpena
 Ann Arbor
 Galesburg
 Ashtabula, O.
 Paden City, W. Va.
 Wyandotte
 Champion
 Greenville, Pa.
 Ironwood
 Perrysburg, O.
 Detroit
 Detroit
 Pontiac
 Columbiaville
 Detroit
 Oak Harbor, O.
 Escanaba
 Detroit
 Middleville
 Pratt, Kans.
 Marquette
 Saginaw
 Ann Arbor

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Erwin William Henschel	4	
Howard Douglass Herbst		
Amandus Hillery Hermann	E	109
Erwin Justus Herrick	4	
Samuel Hersch	M	25
Carll Spencer Herzig	E	26
Harold Louis Herzig	E	28
George Kellogg Hess		
Oliver Frank Heyden	M	72
Harold Leo Heyser	M	113
Harold Adam Hicks	M	33
Harold Osmund Hicks	C	125
Harold Brown Higbee	Ch	48
Emery William Higgins		
Carlton Hill		
Ernest Kelsey Hill	4	
Raymond Alva Hill	C	127
Theodore Case Hill	C	28
Robert Jacob Hiller	8	
Irvin Albert Hilliard	M	18
William Parkhurst Hindman	C	28
Andrew Vodges Hislop		
Harold DeWitt Hoffman	C	21
Wallace Glenn Hoffman	Ch	53
Ward Wilfred Hogue		
Fred Herman Holloway	M	25
Willard Coit Holmes	C	82
Willard Henry Holt	M	29
Jacob Harry Holub	4	
Homer Thomas Hood	Ch	110
George W. Hooper	Ch	68
Anzelm Horbaszewski	M	72
Gerald Joseph Horvitz	Ch	33
Charles William Howell	E	96
George Henry Howell	E	71
Carroll Leslie Hoyt	C	65
Ai Yu Huang	C	135
Sih Ung Huang	M	83
Edward King Hubbard	C	41
Howard Adams Hubbell	C	31
Ashley Welles Hudnut	M	104
Harry LeRoi Hudson	C	124
James Edward Hughes	M	61
Lyndall Edward Hughes	C	49
Ernest Fredrick Hughitt	C	50
Lucius Gaylord Hulbert	8	
Clyde Hum	8	
Hiram Humiston	E	15
Louis Wood Hunt	Ch	104

<i>Detroit</i>
<i>Steubenville, O.</i>
<i>Calumet</i>
<i>Elkhart, Ind.</i>
<i>Cleveland, O.</i>
<i>Toledo, O.</i>
<i>Toledo, O.</i>
<i>Benton Harbor</i>
<i>Detroit</i>
<i>Battle Creek</i>
<i>Ann Arbor</i>
<i>Grand Rapids</i>
<i>Franklin, Pa.</i>
<i>Osego</i>
<i>Hart</i>
<i>Marquette</i>
<i>Phoenix, Ariz.</i>
<i>North East, Pa.</i>
<i>Dayton, O.</i>
<i>East Jordan</i>
<i>Grand Rapids</i>
<i>Omaha, Nebr.</i>
<i>Dolgeville, N. Y.</i>
<i>Three Oaks</i>
<i>Niagara Falls, N. Y.</i>
<i>Rochester, N. Y.</i>
<i>Kansas City, Mo.</i>
<i>Ironwood</i>
<i>Akron, O.</i>
<i>Lansing</i>
<i>Victoria</i>
<i>Filipow, Poland</i>
<i>Detroit</i>
<i>Lancaster, N. Y.</i>
<i>Detroit</i>
<i>East Jordan</i>
<i>Canton, China</i>
<i>Shanghai, China</i>
<i>Ann Arbor</i>
<i>Manistee</i>
<i>Ann Arbor</i>
<i>Grand Rapids</i>
<i>Sault Ste. Marie</i>
<i>Philadelphia, Pa.</i>
<i>Escanaba</i>
<i>Detroit</i>
<i>Grayling</i>
<i>Cleveland, O.</i>
<i>Ann Arbor</i>

Edwin Jay Huntington	4	
Emil Adolf Hurme	E	98
Ralph Clifton Huston	M	63
Harold DeBond Hutchinson	4	
Thomas Kay Hutson	Ch	57
Hugo Frederick Hutzel	M	51
Gustavus Adolphus Hyde	BSE	113
Louis Brossy Hyde	C	37
Austin Sinclair Irvine	Ch	113
Otto Jabelmann	S	32
Karl Russell Jackson	E	21
Abraham Jacobson	Ch	94
Edward Worthington James	E	53
Hugh Henry James	C	27
Norman McKinley James	C	41
Arthur Freeman Janes	C	58
Norwood Berridge Jaquess	M	113
Geoffrey Jefferson	6	
Donald Jerome Jeffrey	23	
John Orla Jenkins	Ch	30
Paul Stoltz Jenkins	5	
Angelo Taylor Jennings		
Arthur Curtis Jennings		
Ralph Winthrop Jennings		
Oscar Peter Jensen		
William Jensen		
Harold Jerome	C	49
Richard Cullen Jeter, Jr.	Ch	58
William Henry Jewell	M	29
Carl V. Johnson	M	83
Elmo Grover Johnson	M	77
Lewis Ellsworth Johnson	C	51
Rudolph Herman Johnson	M	35
Waldemar Ogden Johnson	M	68
William Durand Johnston	M	84
Walter Edwin Jominy	Ch	77
Irving Evans Jones	E	82
Carl Frank Joseph		
Clarence Lewis Joy	C	28
Everett Judson	C	29
Robert Clifford Kantner		
Samuel Selig Kaplan		
Charles Dutton Karr	2	
Albert Harold Kaufman	C	66
Anton Kaufman	16	
Dale Wilmer Kaufman	Ch	31
Frank Ezra Kaufman	C	45
Anson Howard Keeler	C	29
Karl Fairbanks Keeler	C	89

<i>Detroit</i>
<i>Valparaiso, Ind.</i>
<i>Ypsilanti</i>
<i>Uniontown, Pa.</i>
<i>Ann Arbor</i>
<i>Muncie, Ind.</i>
<i>Cleveland, O.</i>
<i>Detroit</i>
<i>Toledo, O.</i>
<i>Cheyenne, Wyo.</i>
<i>Pontiac</i>
<i>Cleveland, O.</i>
<i>Detroit</i>
<i>Calumet</i>
<i>Detroit</i>
<i>Tacoma, Wash.</i>
<i>Detroit</i>
<i>Ypsilanti</i>
<i>Sloan, Ia.</i>
<i>Bellefontaine, O.</i>
<i>Detroit</i>
<i>Newport News, Va.</i>
<i>..Eau Claire</i>
<i>Toledo, O.</i>
<i>Stanton</i>
<i>Peshtigo, Wis.</i>
<i>Detroit</i>
<i>Aiken, S. C.</i>
<i>Negaunee</i>
<i>Vandalia</i>
<i>Winona, Minn.</i>
<i>Pentwater</i>
<i>Cadillac</i>
<i>Buffalo, N. Y.</i>
<i>Detroit</i>
<i>Detroit</i>
<i>Fort Wayne, Ind.</i>
<i>Saginaw</i>
<i>Detroit</i>
<i>Cleveland, O.</i>
<i>Altoona, Pa.</i>
<i>Chicago, Ill.</i>
<i>Holland</i>
<i>Washington, D. C.</i>
<i>Saginaw</i>
<i>Flint</i>
<i>Washington, D. C.</i>
<i>Grand Rapids</i>
<i>Provo, Utah</i>

550 *Departments of Engineering and Architecture*

Karl Wheeler Keil	C	80			<i>Grand Rapids</i>
Lester Josef Newman Keliher	C	117			<i>Sault Ste. Marie</i>
Theodore Prince Keller	M	8			<i>Evanston, Ill.</i>
Pearce Clement Kelley					<i>Chicago, Ill.</i>
Dallas Smith Kendall	M	33			<i>Churchville, N. Y.</i>
Edgar Rice Kendall	S				<i>Toledo, O.</i>
Edward Northam Kendall					<i>Rochester, N. Y.</i>
Chester Clare Kennedy	Ch	93			<i>Pittsburg, Pa.</i>
Reginald Gilman Kimball	E	29			<i>Portland, Me.</i>
Waldron John Kincaid	C	65			<i>Bradford, Pa.</i>
Mason Hill Kinch	C	59			<i>Port Huron</i>
Elmer Dan King	E	95			<i>Ann Arbor</i>
Marcello Aberdeen King	M	36			<i>Wellsville, N. Y.</i>
Isaac Kinsey, Jr.	M	28			<i>Toledo, O.</i>
Leslie Hosner Kintz					<i>Ann Arbor</i>
Charles Selim Kirby	2				<i>Niagara Falls, N. Y.</i>
Lamar Morey Kishlar					<i>Ypsilanti</i>
Oscar Christian Klager					<i>Ann Arbor</i>
Charles Simon Klein	C	29			<i>Detroit</i>
Julius Klein					<i>Newark, N. J.</i>
Cyril Frederick Kleyn	C	90			<i>Calcutta, India</i>
Eugene William Knapp	E	13			<i>Grand Rapids</i>
Clinton August Knoch	M	37			<i>Detroit</i>
Robert Franz Kohr	4				<i>Washington, D. C.</i>
Emil Frederick Kollmer	S	24			<i>Kokomo, Ind.</i>
Harold Deane Koonsman	E	36			<i>Detroit</i>
William Buddee Kopfer	E	141			<i>Ann Arbor</i>
Benjamin Louis Koppin	E	80			<i>Detroit</i>
Herman Clyde Krapf	E	37			<i>Ann Arbor</i>
Theodore Edward Krauss					<i>Saginaw</i>
Harry Conroy Kreeger	Ch	61			<i>Saint Charles, Ill.</i>
Joseph Plum Kreiner	E	32			<i>Bradford, Pa.</i>
Edward Joseph Kruszk	M	69			<i>East Lake</i>
Chen Miu Ku	Ch	113			<i>Chekiang, China</i>
Eugene George Kuebler	E	115			<i>Ann Arbor</i>
Karl Herman Kugel	M	66			<i>Sandusky, O.</i>
John Victor Kuivinen					<i>Wakefield</i>
Raymond Albert Kunding	Ch	77			<i>Detroit</i>
Charles Robert Kunze	4				<i>Detroit</i>
George William Kunze					<i>Wyandotte</i>
Hsien Kwei Kuo	M	20			<i>Shanghai, China</i>
Walter William Kurtz	M	64			<i>Saginaw</i>
George Johnson Kysor	Ch	87			<i>Niagara Falls, N. Y.</i>
Harold Hunt LaFever	E	110			<i>Jonesville</i>
Albert Norman Laird	C	112			<i>Detroit</i>
Harold Julian LaLonde	C	124			<i>Sault Ste. Marie</i>
Lawrence William Lamb					<i>Fennville</i>
Roy Douglas Lamond	14				<i>Chicago, Ill.</i>
Rekkard Gullik Landerud	7				<i>Ironwood</i>

Vernon Curtis Landon			
Howard Adam Lang	M	69	
Henry Langendorf	Ch	81	
Lloyd Lewis Langworthy	E	107	
Walter Wair Larsh	C	31	
Herbert Fredrick Larson	C	77	
Harold Burrows Lawrence	M	95	
Reuben Herman Lawson			
Walter Edwin Lay	M	72	
Harry Raymond Leach	S	27	
Sagito Jite Leach	8		
Hubert Samuel Leader			
Walton Alfred Lean			
Victor Manuel Lebron			
Lawrence George Lenhardt	C	102	
Waldemar Andrew Lenski	C	32	
Clyde Ernest Leshner	C	128	
Claude R. Lester	E	116	
George Albert Leszczynski	M	25	
Edward Letsinger	S	28	
John LeValley	M	75	
Leslie Lou LeVeque	C	22	
George Alfred Leverenz	C	52	
Dempster Chase Lewis	M	28	
Edward Jacob Lewis	Ch	71	
Frank Arthur Lewis	C	25	
Hui Kwang Li			
Henry William Lichtner	M	110	
Richard Thomas Liddicoat	C	28	
Albert Henry Liese	C	31	
Gie Seng Ling	C	67	
Howard Brooke Little	Ch	54	
James John Livingston	C	112	
Stanley Dinsmore Livingston	E	71	
Thomas W. Palmer Livingstone	Mar	116	
John Merkel Loeblein	M	86	
Harry Driesbach Long			
Jay Earl Long	E	26	
Carlos Guillermo Lopez	8		
Everett Otley Loring	M	50	
Flavius Earl Loudy	Mar	55	
Robert Corkey Loughhead	E	111	
John Windsor Lovell	C	78	
Francis Brown Lowry	8		
John Hugo Ludwig	C	98	
Gerhardt Louis Luebbers	M	113	
Harold Ernest Lueck	8		
Robert Alexander Lundell	M	33	
Frank Eugene Lyon	Ch	32	

Syracuse, N. Y.
 Erie, Pa.
 Chicago, Ill.
 Cherry Creek, N. Y.
 Cheyenne, Wyo.
 Crystal Falls
 Decatur
 Cheboygan
 Farwell
 Saginaw
 Conneaut, O.
 Grand Rapids
 Laurium
 Yauco, P. R.
 Detroit
 Grand Rapids
 Mancelona
 Saint Johns
 Harbor Beach
 Kokomo, Ind.
 Medina, N. Y.
 Marquette
 Detroit
 Utica, N. Y.
 Chicago, Ill.
 Marquette
 Shanghai, China
 Grand Rapids
 Kearsarge
 Chicago, Ill.
 Foochow, China
 Monroe
 Menominee
 Englewood, N. J.
 Detroit
 Lakewood, O.
 Williamsville, N. Y.
 Steelton, Pa.
 Quito, Ecuador
 Dallas Center, Ia.
 Hancock
 Kalamazoo
 Ann Arbor
 Denver, Colo.
 Buffalo, N. Y.
 Emden, Ill.
 Mancelona
 Cadillac
 Mancelona

John Joseph Lyons, Jr.	M	38	<i>Pittsburg, Pa.</i>
Robert Bruce Lytle	C	27	<i>Detroit</i>
Elwood Kirkland McAllister	C	29	<i>Rochester, N. Y.</i>
Ray Charles McAllister	M	69	<i>Knowlesville, N. Y.</i>
Robert Gavin McAndrew	M	27	<i>Saint Thomas, Ont.</i>
Thomas Henry McArdle	C	20	<i>Chateaugay, N. Y.</i>
Clebert Lineol McBride			<i>Buffalo, N. Y.</i>
Gordon Brown McCabe	E	69	<i>Detroit</i>
Guilbert Carlyle McCamman	C	64	<i>Charlotte</i>
Russell Hudson McCarroll	Ch	121	<i>Detroit</i>
Charles Hibbs McClellan	M	81	<i>Ann Arbor</i>
Allan Miles McConnell	16		<i>Rochester, N. Y.</i>
Robert Donald McCree			<i>Chicago, Ill.</i>
Bernard Aloysius McDonald	E	58	<i>Rochester, N. Y.</i>
Chester Rice McDonald			<i>Jackson, O.</i>
John MacEwell	M	112	<i>Bandon, Ore.</i>
Harold James McFarlan	4		<i>Flint</i>
Arthur Branch McGee	C	41	<i>Ann Arbor</i>
Ralph Edgar McGee			<i>Marietta, O.</i>
Alvin Ermine McGrath	C	28	<i>Green Bay, Wis.</i>
Clifford Thomas McIntyre	C	24	<i>Saint Thomas, Ont.</i>
Turney Swartz McIntyre			<i>Greensburg, Pa.</i>
Angus Vaughan McIver	C	89	<i>Great Falls, Mont.</i>
Francis Test Mack	M	38	<i>Toledo, O.</i>
Lee Malcolm McKeague			<i>Detroit</i>
Josiah Slutz McKean, Jr.	BSE	101	<i>Canal Dover, O.</i>
Charles Arthur McKenny	M	23	<i>Ypsilanti</i>
Carlton Dietly McKenzie			<i>Quincy</i>
Joseph Wesley Mackenzie	M	55	<i>Adrian</i>
Donald Edwin McKisson			<i>Toledo, O.</i>
Archibald Ross MacLaren	M	107	<i>Port Huron</i>
Earle Roderick McLaughlin	14		<i>Washington, D. C.</i>
Angus Daniel McLay	S	29	<i>Sault Ste. Marie</i>
Thomas Bowen McMartin			<i>Milwaukee, Wis.</i>
Onie El Roy McMullen	C	28	<i>Elk Rapids</i>
Robert Letts McNamee			<i>Dundee</i>
Archibald Kane MacNaughton	E	12	<i>Calumet</i>
Edmon Perrin McQueen	C	78	<i>Lowell</i>
John Reuben McWilliams			<i>Collinsville, Okla.</i>
Joseph Henry Mahar	C	74	<i>Grand Rapids</i>
Dale Ray Maltby	M	23	<i>Kalamazoo</i>
Jarvis Carter Marble	M	46	<i>Washington, D. C.</i>
Edward Syrenous Marks, Jr.	M	106	<i>Auburn, N. Y.</i>
Edwin Kramer Marshall			<i>Oak Park, Ill.</i>
Ellis Thurston Marshall	E	104	<i>Kalamazoo</i>
Fritz George Marsteller	E	33	<i>Schmalkalden, Germany</i>
Edmund Marth	8		<i>Rochester, N. Y.</i>
Harry E. Martin	Ch	89	<i>Imlay City</i>
Ira Emmet Martin	6		<i>Birmingham</i>

Julius Alva Martinek	E	112	
Roscoe John Mason			
Howard Charles Matthews			
Carl Lorenze Mattsson	Mar	73	
Raymond Herbert Mau	C	101	
Vung Tsoong Maw	C	94	
Walter Everett Maxwell	C	38	
Forrest Lewis Mead	C	22	
Merle Kimberly Mead			
Joseph Frederick Meade	S	6	
Chidley Davis Mears	Mar	49	
Julius Meisenzahl	M	49	
Shirley Lee Menefee			
Albert Russell Menerey			
Ericsson Hayward Merritt		12	
Leon Ford Merritt	M	55	
Rex Lawrence Mersereau	M	27	
Wilbur Leonard Mertz	M	34	
Edwin George Metcalf	M	80	
Robert Levens Metcalf	M	91	
George Orrin Middleditch		2	
Philip Hastings Middleditch	M	57	
Martin Paul Middlekauff			
Edward Anderson Middleton			
Harry Arthur Miles	C	69	
Elbert Gray Milham	Ch	33	
Wayne William Milham	M	94	
Earl B. Miller	M	72	
Elmer Warren Miller	C	89	
George Earl Miller	E	106	
Harry Edgar Miller	C	35	
Harry William Miller			
Wyatt Acton Miller	Ch	32	
Kirk Radcliffe Millhoff			
Jacob Gorton Milliken	M	41	
†Harold Fildew Millman,	p	29	
Charles Sims Mills		6	
Russell Hill Mills	M	100	
Harry Edward Miner	M	54	
Gordon Richmond Mirick	Mar	12	
Carl Rudolph Misch		6	
Leonard Boris Moiseyeff	M	97	
Kenneth Hilton Monroe		4	
Lowell Strong Monroe	E	35	
Harry Evans Montelius		8	
Floyd Liddon Moon	E	125	
Melvin Lyman Moone	C	109	
William Charles Mooney	S		
Charles William Moore	E	71	

Traverse City
 Mount Clemens
 Northampton, Mass.
 Detroit
 Highland Park
 Soochow, China
 Schenectady, N. Y.
 Kalamazoo
 Erie, Pa.
 Buffalo, N. Y.
 Kalamazoo
 Rochester, N. Y.
 South Omaha, Nebr.
 Yale
 Lockport, N. Y.
 Detroit
 LaGrange, Ill.
 Saginaw
 Willoughby, O.
 Columbus, O.
 Detroit
 Petoskey
 Hagerstown, Md.
 Aberdeen, Wash.
 Detroit
 Kalamazoo
 Kalamazoo
 Watertown, N. Y.
 Grand Junction, Colo.
 Dryden
 Mancelona
 Northampton, Mass.
 Salem, N. J.
 Cleveland, O.
 Bay City
 Saint Johns
 Greencastle, Ind.
 Ann Arbor
 Durand
 Rochester, N. Y.
 Port Huron
 Khabarovsk, Russia
 Detroit
 Dayton, O.
 Circleville, O.
 Ann Arbor
 Medina, N. Y.
 Pittsburg, Pa.
 Dowagiac

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Vincente Mario Morales	Ch	48	<i>Arecibo, P. R.</i>
Dwight Cadogan Morgan, Jr.			<i>Kittanning, Pa.</i>
Joseph Theodore Morris			<i>Punxsutawney, Pa.</i>
Wade Hampton Morrow			<i>Benton Harbor</i>
Floyd Chester Morse	C	98	<i>Ann Arbor</i>
Jesse Ray Moser	M	52	<i>Highland Park</i>
Clarence Arthur Mote	E	77	<i>Lake Odessa</i>
Arthur Douglass Mott, Jr.			<i>Oak Park, Ill.</i>
Harry Albert Moul	S	9	<i>Philadelphia, Pa.</i>
Claude Elmer Mowrer	E	78	<i>Ypsilanti</i>
Hermann Gundert Mueller	C	75	<i>Saginaw</i>
Homer Louis Mueller	C	109	<i>Cleveland, O.</i>
Philip Owen Mulkey	M	31	<i>Detroit</i>
Christian Rudolph Muller	M	33	<i>Roswell, New Mex.</i>
John Mitchell Munson			<i>Tacoma, Wash.</i>
Elmer George Munz	M	25	<i>Detroit</i>
Donato Joseph Muscio			<i>Waterbury Conn.</i>
George Arnold Myers			<i>Herkimer, N. Y.</i>
Leon Charles Myers	4		<i>Battle Creek</i>
Rowland Aloysius Nadeau	M	25	<i>Flint</i>
Douglas Bailey Nagle	M	25	<i>Erie, Pa.</i>
Roland Emin Nank	Mar	43	<i>Mount Clemens</i>
John Thomas Naylor	Ch	80	<i>Detroit</i>
Frank R. Nethaway			<i>Burton</i>
John Waldo Neumann	6		<i>Detroit</i>
Hugh Wilhelm Newberg	M	28	<i>Grand Marais</i>
Alfred Thomas Newbold	E	32	<i>Flint</i>
Francis Deming Newbrook	M	23	<i>Buffalo, N. Y.</i>
James Francis Newell			<i>Yale</i>
Ralph William Newton	C	64	<i>Glen Ellyn, Ill.</i>
Thomas Harry Nicholl	C	50	<i>Anderson, Ind.</i>
Maurice Nicholls			<i>Pittsburg, Pa.</i>
Arthur Herbert Niles	E	32	<i>Ann Arbor</i>
Ray Walter Niles	E	16	<i>Croswell</i>
Earl Edward Norman	4		<i>Kalamazoo</i>
Maynard Amos Norris	Ch	35	<i>Fostoria, O.</i>
Irving Towne Norton	C	45	<i>Northampton, Mass.</i>
James Ray Norton	E	129	<i>Little Valley, N. Y.</i>
John Kennedy Norton	C	37	<i>Ontonagon</i>
Harold Anthony O'Connell			<i>Buffalo, N. Y.</i>
† Henry Nicholas Oellrich, p	E	29	<i>Narrowsburg, N. Y.</i>
Thomas Edward O'Neill			<i>Williamsport, Pa.</i>
Arthur Louis Oppenheimer	C	27	<i>Grand Rapids</i>
Seymour Ainsworth Oppenheimer	C	60	<i>Grand Rapids</i>
Burr Kenneth Osborn			<i>Detroit</i>
Fitz Edward Griswold Otis			<i>Lake Clear Junction, N. Y.</i>
J. Hawley Otis	4		<i>Kibbie</i>
Clarence Isaac Owen	2		<i>Detroit</i>
Albert Pabst, Jr.	E	91	<i>Canfield, O.</i>

Frederick Leisen Packard					<i>Menominee</i>
Thomas Foster Paisley	4				<i>Dubuque, Ia.</i>
Almer William Palas	M	28			<i>Fannystelle, Manitoba</i>
Wen Huan Pan	C	64			<i>Shanghai, China</i>
Dai Tung Pang	M	42			<i>Honolulu, Hawaii</i>
Newton Warren Paquette					<i>Toledo, O.</i>
Colin S. Park	E	89			<i>Metamora</i>
Harold Hills Parks					<i>Lander, Wyo.</i>
Robert Chester Parks					<i>Birmingham</i>
Henry Spaulding Parsons	M	68			<i>Elmira, N. Y.</i>
Louis Edgar Partch	12				<i>Des Moines, Ia.</i>
Byron James Paschal	Ch	18			<i>Blissfield</i>
George Cornell Paterson	M	110			<i>Detroit</i>
Hamilton Hector Paterson					<i>Detroit</i>
John Douglas Paterson, B.S.	Ch	81			<i>Capac</i>
<i>Adrian College</i>					
Meade Winthrop Patterson					<i>Lockport, N. Y.</i>
Freeman Nelson Pattison	C	81			<i>Ann Arbor</i>
Carl Herman Pehrson	Mar	39			<i>Mitchell, S. Dak.</i>
David William Pence					<i>Detroit</i>
Cecil Leroy Penoyer					<i>South Haven</i>
Donald Lee Perkins					<i>Ann Arbor</i>
Harold Harwood Perry	M	41			<i>Bay City</i>
Lyell Perry	E	111			<i>Ann Arbor</i>
Fred Karl Petermann	4				<i>Laurium</i>
Charles Albert Peters, Jr.	2				<i>Washington, D. C.</i>
Clarence Edward Peterson	5				<i>Denver, Colo.</i>
Irwin William Petrie	4				<i>Herkimer, N. Y.</i>
Petter George Pettersen	E	33			<i>Big Rapids</i>
Lewis Howard Pettibone	M	16			<i>Corunna</i>
George John Pezold	M	64			<i>Buffalo, N. Y.</i>
Carl Boes Pfeifer	Ch	119			<i>Utica, N. Y.</i>
John Joseph Francis Phalan	S	32			<i>Rome, N. Y.</i>
Otto Karl Philipp	C	28			<i>Kalamazoo</i>
Harold Irving Phillips	E	74			<i>Calumet</i>
Howard Hiram Phillips	C	33			<i>Grand Rapids</i>
Joseph Adam Pikulski	C	114			<i>Lublin, Russian Poland</i>
David Wills Pinkerton	4				<i>Toledo, O.</i>
Sherwood Mortley Pinkerton, Jr.	Ch	43			<i>Toledo, O.</i>
Pedro Antonio Piza					<i>San Juan, P. R.</i>
Arthur Glenn Plankel	Ch	52			<i>Pontwater</i>
Clayton Ernest Plummer	Ch	107			<i>Dowagiac</i>
James Randal Pollock					<i>Decatur</i>
William Karl Pommerening	C	64			<i>Ann Arbor</i>
Warren LeRoy Porter	E	16			<i>Saint Ignace</i>
Gilbert Webster Potts	4				<i>Toledo, O.</i>
Philip Orland Potts	E	33			<i>Washington, D. C.</i>
Ray Hamilton Potts	M	94			<i>Detroit</i>
Frank Montrose Powell	Mar	73			<i>Perrysburg, O.</i>

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Guy Clarke Powell	E	29	<i>Exeter, Ont.</i>
Winfred William Powers			<i>Farmersville, N. Y.</i>
John Dexter Preston	M	52	<i>Saint Joseph</i>
Ralph Arthur Price	Ch	115	<i>Bay City</i>
Karl Joseph Probeck	C	79	<i>Cleveland, O.</i>
Jesse B. Proper			<i>Flint</i>
George Fernand Prussing	C	69	<i>Chicago, Ill.</i>
Earl William Publow	E	25	<i>Gaylord</i>
Chester Wilson Pullen			<i>Milan</i>
†Everett William Pulling, a			<i>Windsor, Ont.</i>
Edwin Kenneth Purchase		4	<i>Detroit</i>
Frank Leroy Putnam	M	50	<i>Oswego, N. Y.</i>
Clarence James Quail	E	17	<i>Port Huron</i>
Hazel Irene Quick	C	71	<i>Gaylord</i>
Harold Glenn Raesley	M	70	<i>Marshall</i>
Linn Maynard Rakestraw	Mar	68	<i>Toledo, O.</i>
Juan Manuel Ramos	C	122	<i>Camaguey, Cuba</i>
Roger Spencer Rankin	Ch	46	<i>Detroit</i>
Leon James Ransom			<i>Walloon Lake</i>
Carey Lee Ratcliffe			<i>Natchez, Miss.</i>
Wallace Berry Ratliff	M	94	<i>Carlisle, Ky.</i>
Edward Peter Ratz	M	60	<i>Trimountain</i>
Nelson Ildo Raymond	C	99	<i>Marshall</i>
James Willard Raynsford	C	63	<i>Highland Park</i>
Thatcher William Rea			<i>Detroit</i>
Carleton Wight Reade		12	<i>Escanaba</i>
Macdonald Seymour Reed	M	37	<i>Erie, Pa.</i>
Beauford Houston Reeves	C	120	<i>Louisville, Ky.</i>
Albert Emanuel Reichert		8	<i>Ann Arbor</i>
Chester Kenneth Reichert			<i>Erie, Pa.</i>
Walter Albert Reichle	E	33	<i>Saginaw</i>
James Morton Reid	C	32	<i>Ann Arbor</i>
Wallace Edward Reid	C	36	<i>Detroit</i>
Ira Herbert Reindel	C	56	<i>Detroit</i>
Joseph Garland Rempis			<i>Grand Rapids</i>
†William Samuel Reveno, p			<i>Detroit</i>
Dee Allen Reynders	C	119	<i>Grand Rapids</i>
Charles Raymond Reynolds	E	62	<i>Toledo, O.</i>
Ralph Govan Rhodes	C	60	<i>Metamora</i>
William Murdoch Riach			<i>Chicago, Ill.</i>
Harvey M. Rice	M	37	<i>Caro</i>
Clarence Dalman Rich	M	75	<i>Fort Wayne, Ind.</i>
Emmett Lewis Rich			<i>Herkimer, N. Y.</i>
Emlyn Rosser Richards	S	26	<i>Alliance, O.</i>
Lester Jay Richards	M	21	<i>Coopersville</i>
Wesley Arthur Richards	Ch	25	<i>Waterbury, Conn.</i>
Allan Townshend Ricketts	C	88	<i>Plainfield, N. J.</i>
George Guy Riddle	M	29	<i>Morenci</i>
Clarence Eugene Ridley	C	116	<i>Romeo</i>

Earl Dwain Ridley	S	46	
Frank Carl Riecks	M	37	
Robert Scott Ripley, B.S.	C	73	
<i>Hobart College</i>			
Irving Stanford Ritter	Mar	20	
James H. Ritzema	M	24	
Harold Whittemore Rix	M	43	
Antenor Rizo-Patron	Ch	107	
J. D. Roach	M	64	
John Clapp Robbins			
John Pugh Roberts	Ch	69	
Paul Robertson	2		
Theodore Mead Robie	M	113	
James Wilson Robinson	Ch	71	
Max Gain Robinson			
Willard Franklin Robinson	C	35	
Arthur David Roeser			
Harold Charles Roeser	E	28	
Clell Mosher Rogers	E	148	
Theodore Neil Rogers	E	141	
Arthur Charles Rohn	Mar	95	
Joseph Sullivan Roman	E	35	
Harry Clay Rood	M	67	
James Hunter Roper	C	112	
Reginald Warwick Rose	4		
Nathaniel Alfred Rosenblum	C	119	
Paul Rosenthal	C	86	
Nathan Rosenzweig	Ch	18	
Carl Elias Roser			
Albert Roth	C	110	
Lancelot Charles Rowley	C	25	
Marcus George Ruppe			
Howard Jesse Rupright	Ch	73	
†Maurice Lane Rushmore, p	Ch	21	
Bruce Albert Russell	Mar	110	
Charles Pratt Russell			
Walter Clair Russell	C	29	
Gerritt Adrian Rutgers	E	24	
Exel Arnold Ruthstrom	Mar	109	
David Alvin Ruxton	M	34	
Whiting John Ryan	E	71	
Hilary Frank Rye	C	114	
Fred Sacia	E	73	
Henry Milburn Salisbury	Ch	32	
George Harold Sandenburgh	C	46	
Walter Woodward Sanderson, Jr.	C	33	
Russell Van Sanford	E	67	
†Sterling Skillman Sanford, a		15	
Lawrence Martin Saunders	C	67	

Romeo
Alpena
Geneva, N. Y.
Romulus, N. Y.
Grand Rapids
Oscoda
Lima, Peru
Leamington, Ont.
Cleveland, O.
Eric
Traverse City
Washington, D. C.
Sturgis
Chicago, Ill.
Detroit
Mount Clemens
Saginaw
Wellington, O.
Wellington, O.
Ypsilanti
Saginaw
Muskogon
Washington, D. C.
Detroit
New York, N. Y.
New York, N. Y.
Detroit
Detroit
Lowell
Lewistown, Mont.
Hancock
Coldwater
Old Mission
Petersburg
Battle Creek
Litchfield
Holland
Hancock
Shelby
Munith
Sault Ste. Marie
Grand Rapids
Battle Creek
Onkama
Port Huron
Grand Rapids
Mount Clemens
Athol Springs, N. Y.

558 *Departments of Engineering and Architecture*

Fred Morgan Sawin	M	41	Ann Arbor
Guy Edmund Sawyer			South Haven
Walter John Schaefer	M	93	Saginaw
Ludwig Schairer	M	28	Detroit
Harley Torrence Schanck			Ann Arbor
George Augustus Scheibel			Holyoke, Mass.
Robert Domitio Schindler	M	68	Toledo, O.
John Henry Schmidt	Ch	41	Saginaw
Alwin Wilhelm Schneider			Ann Arbor
Chester Seitz Schoepfle	Ch	109	Sandusky, O.
Wilbur John Schoepfle			Sandusky, O.
Starr Rogers Schofield	M	121	Macon, Ga.
William Henry Schomburg	M	105	Toledo, O.
Louis William Schoon, Jr.	E	42	Holland
Arthur August Schupp	2		Saginaw
Frank Conrad Schwarzenberg		8	Muskegon
Ned Vaughan Scott, B.S.	C	127	Thomasville, Ala.
<i>University of Alabama</i>			
Ralph Sam Scott			Chicago, Ill.
Harold Ralph Scovill	4		Hudson
Waldo Lorin Scovill	Ch	68	Hudson
Gregory George Scramas, A.B.	E	120	Vallona, Turkey
<i>Anatolia College</i>			
William Warner Seabury			Ann Arbor
Earl Ray Seavolt			Mount Vernon, O.
Frederic William Sevin	4		Erie, Pa.
Robert Edward Sevin	4		Erie, Pa.
George Lawrence Sewell	E	86	Detroit
Samuel Paul Shackleton	E	78	Kalamazoo
Solomon Shappirio	Ch	80	Washington, D. C.
Donald Shattuck			Owosso
William Albert Shaver	M	69	Saginaw
Clarence Wall Shea	20		Alpena
Thomas Walter Sheahan, A.B.	M		Detroit
<i>University of Detroit</i>			
Frank William Sheehy	Ch	63	Yale
Howard William Sheldon			Olean, N. Y.
Tsu Way Shen	C	124	Shanghai, China
Harold Sherman	C	33	Ellenville, N. Y.
Chase Barmo Sikes	C	28	Wayne
Joseph Silverman	Mar	93	Bessemer
Archibald Charles Simons	C	38	Mount Morris
Seymour Broudy Simons	M	22	Detroit
Howard Woodworth Simpson		10	Detroit
Morgan Elmer Siple	S		Hubbell
Alfred Theron Sirrine			Holland
George Harold Sisler	M	65	Clinton, O.
Clarence Oramel Skinner			Lansing
William Whitney Slaght	E	56	Buffalo, N. Y.

Stanley John Slazinski			
Arthur Lucius Sloman	C	115	
Merwin Noble Smalley	M	69	
Clarence Frederick Smart	Ch	28	
Carl Waldemar Smedberg	C	84	
Glenn Worth Smiley	E	106	
John Benjamin Smiley	C	55	
Chauncey Webb Smith	E	32	
Clare Thomas Smith	C	16	
Clarendon Waite Smith	C	65	
Dale L. Smith	M	36	
Donald Abraham Smith	E	26	
Edison Chester Smith	C	25	
Edward John Smith	M	73	
Frederick Bradford Smith, Jr.	M	28	
George Brick Smith	Mar	21	
Gordon Smith	4		
Harold James Smith	Ch	36	
Harry Horace Smith	M	50	
Herschel C. Smith, A.B.	C	129	
Joseph Thomas Smith			
Odell Wesley Smith	M	90	
†Robert Edgar Laurie Smith, Jr., a		15	
Rowland Douglas Smith	Ch	32	
Roy Robert Smith	C	89	
Rudolph Otto Smith	M	103	
Steven Harold Smith	C	27	
Uhl Manchester Smith	E	27	
Westcott Timpson Smith	M	79	
Francis McFarland Snider	M	132	
Howard Clinton Snyder	4		
Thomas Phillips Soddy	M	27	
Abraham Solomon	C	82	
Harry George Sparks			
Raymond Henry Spechke			
Herbert Ruben Spencer	M	61	
George William Spender			
Don Allen Sprague	8		
Gale Alton Sprague			
Locke Audubon Sprague	M	52	
Bert Arnold Standerline	Ch	71	
William Lewis Stanton	C	34	
George Philip Alexander Stape	C	104	
Cyril Benjamin Starring	Ch	27	
Vernon Andrew Stead			
Henry Dean Stecher	M	69	
Clement Caleb Steck	E	70	
Sidney Tremble Steen	M	43	
George Edwin Steers	Mar	54	

Bay City
 Coldwater
 New Canaan, Conn.
 Boyne City
 Ishpeming
 Bangor
 Lancaster, N. Y.
 Hubbardston
 Mason
 Worcester, Mass.
 Eaton Rapids
 Algonac
 Niagara Falls, N. Y.
 Ann Arbor
 Detroit
 Washington, D. C.
 Toledo, O.
 Wilmette, Ill.
 Detroit
 Pheonix, Ariz.
 Cortland, N. Y.
 Port Huron
 Rockville, Md.
 Battle Creek
 Brewster, Wash.
 Houghton
 Lewistown, Mont.
 Howell
 Port Huron
 Wheeling, W. Va.
 Detroit
 Calumet
 Superior, Wis.
 Jackson
 Mount Vernon, O.
 Morenci
 Waterbury, Conn.
 Cheboygan
 Charlotte
 Bloomfield Hills
 Jones
 Athens, Ga.
 Rochester, N. Y.
 Rochester
 Detroit
 Rocky River, O.
 Indianapolis, Ind.
 Allegan
 Kalamazoo

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Roy Simon Stein	Ch	71		<i>Chicago, Ill.</i>
Nelson Cornelius Steketee				<i>Holland</i>
Richard Henry Steketee	C	69		<i>Holland</i>
Bernhard August Stenberg		6		<i>Chicago, Ill.</i>
Paton Carlyle Stephen				<i>Syracuse, N. Y.</i>
Lafayette F. Stephenson	M	118		<i>Toledo, O.</i>
Walter Adam Sterling	12			<i>Negaunee</i>
William Valentine Sternberger	Ch	70		<i>Halfway</i>
Charles Orrin Stetler				<i>Jackson</i>
Fred Leyerer Stevenson	M	65		<i>Saginaw</i>
George Alfred Stevenson				<i>Ann Arbor</i>
Bedell Porter Stewart				<i>Dearborn</i>
Walter Harvey Stewart	M	69		<i>Detroit</i>
Earl Richard Stone	M	60		<i>Attica, N. Y.</i>
Frank Clinton Stone				<i>Detroit</i>
John Wesley Stone	Ch	24		<i>Dorr</i>
Louis Henry Stott	E	29		<i>Manistee</i>
David Davis Stovel	M	78		<i>Ann Arbor</i>
Henry Charles Stovel	M	22		<i>Ann Arbor</i>
Otto Willett Strachan				<i>Muir</i>
Austin Taggart Streeper		6		<i>Morristown, Pa.</i>
Errol Herbert Streeter	Ch	35		<i>Big Rapids</i>
Carleton Elwood Stryker	M	34		<i>Los Angeles, Cal.</i>
Harold William Stubbs	E	68		<i>Brown City</i>
Byron Henry Stuck	M	110		<i>Mount Clemens</i>
Grant Barkley Sturgis	4			<i>Flint</i>
Rafael Pena Suarez	Ch	37		<i>San Juan, P. R.</i>
Kameichi Sugiyama	4			<i>Hirashima, Japan</i>
Charles Edmund Sullivan	E	63		<i>Detroit</i>
William Shackleford Sullivan	C	106		<i>Ann Arbor</i>
Chien Hsun Sung	Mar	78		<i>Foochow, China</i>
Herman Oscar Swanson	M	109		<i>Jamestown, N. Y.</i>
George Walter Swatek	16			<i>Chicago, Ill.</i>
Harold Earnest Taft				<i>Ann Arbor</i>
Tsone Ying Tam	Ch	117		<i>Kwangsi, China</i>
Hung Yee Tang	Ch	109		<i>Canton, China</i>
Cyrus Jesse Taylor	M	111		<i>Rochester</i>
Dean Weigand Taylor	E	69		<i>Kewanee, Ill.</i>
Harold Anderson Taylor	4			<i>Rochester</i>
Howard Story Taylor	4			<i>Owosso</i>
Peter Tazelaar	M	74		<i>Kalamazoo</i>
Ansel Leslie Tefft	8			<i>Spokane, Wash.</i>
Lyon Frank Terry	C	71		<i>Rochester, Ind.</i>
Rhinehart Florian Thalner	M	69		<i>Ironwood</i>
George Eddison Thiel	C	64		<i>Pigeon</i>
Charles Lynne Thomas				<i>Charlevoix</i>
Clarence Walter Thomas	E	100		<i>Schoolcraft</i>
Donald Armstrong Thomas	C	45		<i>Milbank, So. Dak.</i>
Edmund Ashley Thomas				<i>Detroit</i>

Glenn Pembroke Thomas	29					<i>Manistique</i>
Henry Martin Thomas	M	77				<i>Ann Arbor</i>
Samuel LeRoy Thomas						<i>Baltimore, Md.</i>
William John Thomas, Jr.	12					<i>Detroit</i>
Frank Barton Thompson	10					<i>Anchorage, Ky.</i>
Harold Thomas Thompson	M	13				<i>Detroit</i>
Howard E. Thompson						<i>Grand Rapids</i>
Roger Withington Thompson	9					<i>Jackson</i>
William Celestian Thompson	M	62				<i>Shelbyville, Ind.</i>
William Grover Thompson, A.B.	C	144				<i>Detroit</i>
<i>University of Detroit</i>						
Carl Haskell Thorington						<i>Northampton, Mass.</i>
Fred Martin Thrun	M	20				<i>Ann Arbor</i>
Anthony Tilma	M	33				<i>Grand Rapids</i>
Marvin Sinclair Titus	M	31				<i>Norwich, N. Y.</i>
Philip Sheridan Titus	4					<i>Norwich, N. Y.</i>
Tom Tobey	M	13				<i>North Newport, N. H.</i>
Benjamin Franklin Tobin, Jr.	M	20				<i>Paye</i>
James Derby Todd	Ch	33				<i>Burlington, Ia.</i>
John Anderson Baush Tompkins, Jr.	C	74				<i>Wauwatosa, Wis.</i>
Millard Halsey Tomcray	E	70				<i>Dowagiac</i>
Gustave Adolph Torell	C	112				<i>New Britain, Conn.</i>
Karl George Totzke						<i>Benton Harbor</i>
Albert Jay Townsend	M	65				<i>Solvay, N. Y.</i>
Tom Christopher Trelfa	C	34				<i>Alpena</i>
Constantine Damianos Tripolitis	Mar	20				<i>Cos, Greece</i>
Edward Porter Turner, Jr.	M	49				<i>Dallas, Tex.</i>
Robert Burns Turner	2					<i>London, Ont.</i>
Charles Franklin Tuttle	M	85				<i>Berkeley, Cal.</i>
Wallace Wells Tuttle	M	88				<i>Taunton, Mass.</i>
Willis H. Tuttle						<i>Grand Rapids</i>
Paul Liszt Ulrich	Ch	47				<i>Three Rivers</i>
Clair Upthegrove	Ch	122				<i>Central Lake</i>
Jackson W. Van Brunt	C	33				<i>Saginaw</i>
Max VandeGreyn	8					<i>Lowell</i>
Fred VandeLaare	M	109				<i>Kalamazoo</i>
Lynn William Van Vleet	C	31				<i>Charlotte</i>
Ernest Robert Vetter	Ch	26				<i>Delphos, O.</i>
Mitchell Victor	Ch	110				<i>Detroit</i>
Jorge Andres Villegas	M	136				<i>Santiago, Chile</i>
Johnson Knight Vivian	M	38				<i>Laurium</i>
†William Robert Vivian, a	7					<i>Laurium</i>
Oscar Paul Vogel	E	40				<i>Sterling</i>
John Clauss Voges						<i>Canton, O.</i>
Frank Joseph Vonachen	M	43				<i>Ann Arbor</i>
Erich von Nostitz	C	36				<i>Toledo, O.</i>
Edwin Julius Wagner	Ch	94				<i>Grand Rapids</i>
LeRoy Raymond Wagner	E	77				<i>Ann Arbor</i>
Paul Clarke Wagner	M	32				<i>Ann Arbor</i>

562 *Departments of Engineering and Architecture*

Milton Fred Wagnitz					<i>Detroit</i>
Harold Edward Waldron	M	81			<i>Mount Pleasant</i>
Karl Ford Walker	4				<i>Washington, D. C.</i>
Watson Frank Walker	C	122			<i>Birmingham</i>
John Benjamin Wallace	E	53			<i>Negaunee</i>
Alphons Charles Wallich	M	97			<i>Detroit</i>
Fred J. Walls	M	24			<i>Orchard Lake</i>
Edward Nicholas Walsh	M	103			<i>Joliet, Ill.</i>
Clayton Norman Ward	C	110			<i>Ottawa Lake</i>
Albert Ellery Wardwell	C	104			<i>Ann Arbor</i>
Harley Davis Warner	M	37			<i>Farmington</i>
Wilbur Wesley Warner					<i>Howell</i>
Walter Warren	M	37			<i>Saginaw</i>
William Balch Warren	E	25			<i>Portland, Me.</i>
Woodward Alfred Warrick	M	77			<i>Alexandria, Va.</i>
Alfred Warring	E	118			<i>Detroit</i>
Harold Waterbury	M	42			<i>Medina, N. Y.</i>
Frederick Carlisle Watrous	E	110			<i>Caro</i>
Walter Weakley Watson	Ch	38			<i>Brownwood, Tex.</i>
William Lee Watson	2				<i>Brownwood, Tex.</i>
Robert Farquar Watt	C	95			<i>Laconia, N. H.</i>
Felix John Watts	5				<i>Windsor, Ont.</i>
Song He Waung	M	122			<i>Chinkiang, China</i>
Harvey Darwood Weaver					<i>Orion</i>
Theron DeWitt Weaver	E	33			<i>Detroit</i>
William Robert Webb	Ch	109			<i>Ypsilanti</i>
Alvin Henry Weber	C	67			<i>Bay City</i>
Forrest Edward Weber	C	29			<i>Detroit</i>
Solomon Marvin Weber	4				<i>Providence, R. I.</i>
Max Eugene Webster					<i>Peoria, Ill.</i>
Chester Eugene Weger	E	109			<i>Edgewater, Colo.</i>
Joseph LaMar Wehmeyer	C	36			<i>Ann Arbor</i>
William Carl Weilbacher	E	63			<i>Springfield, O.</i>
Paul Weinlander	C	75			<i>Sebewaing</i>
Henry Weinstein	C	24			<i>Goshen, Ind.</i>
Robert Weiss	Ch	29			<i>Wyandotte</i>
Carlton Edwin Wells					<i>Dallas, Tex.</i>
Chester Asel Wells	E	99			<i>Holland Patent, N. Y.</i>
Gilbert Bradley Wells	Ch	70			<i>Holland Patent, N. Y.</i>
William Weltner	C	53			<i>Detroit</i>
Otto George Wendel	M	27			<i>Gowanda, N. Y.</i>
Richard Warren Wenzell	S				<i>Kalamazoo</i>
Walter Philip Wesch	C	55			<i>Billings, Mont.</i>
Charles Daniel Wessels	M	32			<i>Detroit</i>
James Lawrence Whalen					<i>Savannah, N. Y.</i>
Thomas E. Moss Wheat	C	83			<i>Manila, P. I.</i>
Frank Crane Wheeler	Ch	61			<i>Cortland, N. Y.</i>
Harold Edmonston Wheeler	Ch	76			<i>Chicago, Ill.</i>
†Robert Irving Wheeler, a	2				<i>Saint Louis</i>

Ralph O. Whitacre	C	21	Canton, O.
Laurence Edwin Whitaker			Detroit
Albert William White	S		Detroit
Kenneth Taylor White			Grosse Ile
Robert Edwin White			Grand Rapids
Roy Albert White	C	128	Central Lake
William Henry White	C	103	Detroit
John Henry Whitney			Mount Clemens
Leon Winans Whitson, B.S.	M	62	Jackson, Miss.
<i>Millsaps College</i>			
Harold Franklin Whittaker	Ch	69	Jackson
Harry Hudson Whittingham		12	Detroit
George W. Wiard			Detroit
Gordon Frank Wickes	C	118	Saint Johns
Howard Charles Wickes	C	113	Saint Johns
William Preston Wickham	C	42	Norwalk, O.
Rex Edwin Wilbur	M	33	Coldwater
Paul Chester Wright Wilcox			Columbia City, Ind.
Lewis Clark Wilcoxon	C	20	Holyoke, Mass.
George Stearns Wiley	Ch	112	Detroit
Robert Doeltz Wiley	M	111	Detroit
Alfred Owen Williams	M	121	Saint Louis, Mo.
†Allan Mackenzie Williams, a			Ludington
Carol Lewis Williams	C	68	Grand Rapids
Cecil Madison Williams	Mar	71	Saint Louis, Mo.
Charles S. Williams	BSE	124	Owosso
Clare M. Williams	E	88	Williamston
George Leslie Williams	M	107	Buffalo, N. Y.
Ralph Hill Williams	Ch	112	Rochelle, Ill.
Carl Einer Wilsberg	Mar	51	Grand Haven
William Henry Wilson	M	20	Sault Ste. Marie
Franklin Robert Winch			Dayton, O.
Harold Brooks Winchell			Northampton, Mass.
Maxwell Merritt Wise	M	107	East Liverpool, O.
Ray Herbert Wiswell			Northampton, Mass.
Robert Emra Wolf	E	73	Hillsdale
Benjamin Blanchard Wood	Mar	81	Wolcott, N. Y.
William Platt Wood	Ch	151	Ypsilanti
Earl Franklin Woodburn	E	60	Grayling
Bruce Woodbury	C	30	Newton, Kans.
Glenn Adelbert Woodhouse	C	94	Comstock
Samuel Trubee Woodhull	E	110	Wading River, N. Y.
Henry Charles Worfel			Grand Rapids
Clarence Buell Worth	Ch	90	Hanover
Clarence Wilmer Wright			Ann Arbor
Edwin Chester Wright	Ch	32	Ann Arbor
Ferris Giles Wright			Coldwater
Da Chang Wu		12	Hanchow, China
†Rudolph Fred Wuensch, a			Rochester, N. Y.

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Siegfried Wurzbarger				<i>New York, N. Y.</i>
Leo John Wykkel	C	106		<i>Kalamasoo</i>
Robert Wylie	E	30		<i>Niagara Falls, N. Y.</i>
Edgar Perkins Wyman	C	44		<i>Nunica</i>
Fang Yen	E	67		<i>Huchow, Chekiang, China</i>
Russell Albert Yerington	E	85		<i>Carson City, Nev.</i>
Shinmatsu Yokoyama	E	24		<i>Nagano, Japan</i>
Edward Robert Young, Jr.	Ch	69		<i>Toledo, O.</i>
Qua Ling Young, A.B.	C	81		<i>Shanghai, China</i>
<i>St. Johns Univ., Shanghai</i>				
Lan Yu				<i>Kiangsi, China</i>
John Zenishek	C	106		<i>Prague, Austria</i>
Franz Perrine Zimmerli				<i>Lyons, N. Y.</i>
Frederick William Zinn	C	122		<i>Galesburg</i>
Frank Ralph Zumbro	E	61		<i>Waynesboro, Pa.</i>
Cecil Edwin Zwickey	8			<i>Detroit</i>

DEPARTMENT OF ARCHITECTURE

Harold Baker Abbott	AII	95		<i>Ann Arbor</i>
Robert Peck Adams	AE	24		<i>Lodi, Cal.</i>
†Charles William Attwood, a	AE	15		<i>Conneaut, O.</i>
Guy Alger Bedell	AE			<i>Ypsilanti</i>
Willis Alley Bellows	AII			<i>Ypsilanti</i>
†Theodore Knapp Bender, a	AII			<i>Grand Rapids</i>
Arnold Brado Berg	AI	57		<i>Duluth, Minn.</i>
Alfred Ewald Bergmann	AII	28		<i>East Jordan</i>
William Alfred Birks	AE			<i>Ann Arbor</i>
Herman Blumberg	AII	6		<i>Detroit</i>
Victor Bonilla	AE	108		<i>Valle, Colombia</i>
John Usher Bosson	AE			<i>Indianapolis, Ind.</i>
Bernard Fayette Boyd	AII	15		<i>Shenandoah, Ia.</i>
Raymond David Boyer	AI			<i>Chelsea, Ia.</i>

* The letters following the names indicate the course or line of work the student has chosen to pursue: AI, architecture, general course; AII, architectural design course; AE, architectural engineering; BSA, the course leading to the degree thus designated; S, miscellaneous studies not leading to any degree. As students are not asked to make choice of course until the beginning of their second year, the absence of a letter indicates that the student is in his first year. The figures following the names indicate the number of hours of credit earned by the student prior to the beginning of the current academic year, 1913-1914, and completed without conditions, or credited to him on advanced standing. By an hour of work is meant the equivalent of one exercise a week for one semester. A dagger (†) preceding a student's name signifies that he also pursued studies for the whole part or part of the year, in some other Department of the University, indicated by an italic letter following the name, to-wit: a, Department of Literature, Science, and the Arts; m, Department of Medicine and Surgery; l, Department of Law; p, School of Pharmacy; h, Homoeopathic Medical College; d, College of Dental Surgery.

Clarence Benjamin Brew	AI	51			<i>Detroit</i>
Fred Adolph Brinkman	AI	33			<i>Kalispell, Mont.</i>
Marion Jessica Bull	AII	27			<i>Easton, Pa.</i>
Donald Eugene Ames Cameron	AE		52		<i>Grand Rapids</i>
Edward deMille Campbell, Jr.	AII				<i>Ann Arbor</i>
George L. Cheffy	AE				<i>Barnesville, O.</i>
Chandler Carroll Cohagen	S	37			<i>Billings, Mont.</i>
Joe Meyrick Colley	S	28			<i>Anchorage, Ky.</i>
Fred Arthur Compton	BSA	130			<i>Fort Wayne, Ind.</i>
John Benjamin Cook	AII	28			<i>Lansing</i>
Harold Lincoln Corsett	AE	33			<i>Olean, N. Y.</i>
Abram Byron Coryell	S				<i>Detroit</i>
Don M. Cottrell	AII	110			<i>Marine City</i>
William James Crawford, Jr.	AE		72		<i>Buffalo, N. Y.</i>
Charles Augustus Crowe	AII	98			<i>Billings, Mont.</i>
William Duncan Cuthbert	AII		73		<i>Ann Arbor</i>
Frank Daniels	AI	120			<i>Seattle, Wash.</i>
Harold Dalziel Davenport	AI				<i>Grand Rapids</i>
Donald Charles Davidson	AI				<i>Evanston, Ill.</i>
Warren Alan Dedrick	S	27			<i>Billings, Mont.</i>
Frank DeRoo	AI				<i>Flint</i>
Clair William Ditchy, A.B.	AII		114		<i>Cleveland, O.</i>
Ray Claus Eastman	AE	35			<i>Kingsville, Ont.</i>
Ethan E. Edloff	AE	24			<i>Detroit</i>
Harold Melvin Edloff	AII	68			<i>Detroit</i>
George Peter Everson	AE	30			<i>Detroit</i>
Charles Essig Firestone	AE		120		<i>Canton, O.</i>
Jesse Flegman	AE	57			<i>Washington, D. C.</i>
†Albert Sylvester Foess, a	AE	64			<i>Lansing</i>
Archibald Franklin Fowler, A.B.	AE		76		<i>Hillsdale</i>
<i>Hillsdale College</i>					
Robert Benjamin Frantz	AII	21			<i>Waynesboro, Pa.</i>
Lynn Ward Fry	AE				<i>Grand Rapids</i>
Philip Carl Furst	AII	6			<i>Bedford, Ind.</i>
Joseph Howard Gaskill	AE				<i>Grand Rapids</i>
Gaylord Calhoun Gill	AI	4			<i>Grand Rapids</i>
Charles Sherwood Godfrey	AE.				<i>Bancroft</i>
Harold William Goetz	AE	27			<i>Bay City</i>
David Jacob Gothold	AE	32			<i>Kalamazoo</i>
Jacob Lester Grauman	AI	12			<i>Louisville, Ky.</i>
Howard Gray	AII				<i>Calumet</i>
Robert Camden Hall	AI	97			<i>Swarthmore, Pa.</i>
George Bradley Hammond	AII		41		<i>Detroit</i>
Ernest Franklin Hartwick	AE	60			<i>Ann Arbor</i>
Alvin Haskell	AE				<i>New York, N. Y.</i>
Edwin Webster Hecker	AE				<i>Century, Fla.</i>
Chester Gail Henninger	AI	27			<i>Akron, O.</i>
Edward Hesse	AI				<i>Louisville, Ky.</i>
Samuel Loder Holmes, Jr.	AII	61			<i>Detroit</i>

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Sherwood Holt	AE	32			<i>Grand Rapids</i>
Russell Cochrane Hutchins	AII	4			<i>Toledo, O.</i>
Morton Hopkins Ingall	AI				<i>Morenci</i>
Arthur Clare Irvin	AI	44			<i>Mount Morris, Ill.</i>
Walter Guy Jameson	AII	35			<i>Buffalo, N. Y.</i>
John Brownlee Jewell	AII	83			<i>Detroit</i>
Dixon Brace Kellogg	AI	65			<i>Reading</i>
†Gerald Lea Kesler, a	AE				<i>Detroit</i>
Floyd Kings	AII	4			<i>Mitchell, S. Dak.</i>
Frederick John Kolb	AII				<i>Monroe</i>
Norman Krecke	AE	107			<i>Detroit</i>
Joseph James Kucera	AE	2			<i>Oak Park, Ill.</i>
Ho Lee	AE	8			<i>Ru-nan, Honan, China</i>
John Henry Lindhorst	AE	41			<i>Cleveland, O.</i>
Hung Tang Low	AE	64			<i>Shanghai, China</i>
John Alexander McColl, Jr.	AE	25			<i>Grand Rapids</i>
George McDonald McConkey	AE	120			<i>Ann Arbor</i>
Ruby Winifred Macomber	AII				<i>Battle Creek</i>
Walter Vancleve Marshall	AE	78			<i>Great Falls, Mont.</i>
George Merrill Mead	AE	41			<i>Ypsilanti</i>
Arthur VanKirk Moninger	AE	95			<i>Washington, Pa.</i>
Robert Bruce Morrison	AE	62			<i>Hancock</i>
James Blaine Newman	AE	115			<i>Detroit</i>
Walter Wilmoth Pearl	AI	56			<i>Harbor Springs</i>
Raymond Chester Perkins	AE	80			<i>East Orange, N. J.</i>
George Lincoln Pettit	AI	25			<i>Eaton Rapids</i>
Frederic Boes Pfeifer	AI	14			<i>Utica, N. Y.</i>
John Henry Pielmeier	AII	25			<i>Chelsea</i>
Howard Earl Ramsey	AE	7			<i>Kalamazoo</i>
Laurence Tucker Ray	AII				<i>Ann Arbor</i>
Edwin Morton Read	AI	4			<i>Brockport, N. Y.</i>
George Luther Richardson	AII	55			<i>Providence, R. I.</i>
Warren Lester Rindge	AI	61			<i>Grand Rapids</i>
Florence Bell Robinson	S	108			<i>Lapeer</i>
Clarence Leslie Rothrock	AII				<i>Stuebenville, O.</i>
Raymond Sanderhoff	AI	2			<i>Owosso</i>
Robert Linwood Satterwhite, Jr.	AII	17			<i>Franklin, Pa.</i>
Malcolm Gregory Simons	AII	93			<i>San Antonio, Tex.</i>
Walter Harry Smith	AE	37			<i>Cleveland, O.</i>
Glen Kirk Sprague	AE	37			<i>Detroit</i>
Franklin Cox Stanton	S	22			<i>Detroit</i>
Stanley A. Stock	AI	49			<i>Saint Joseph</i>
Frederick Gustavus Strauss	AE	4			<i>Saint Clair</i>
Clair Alexander Stuchell	AII	31			<i>Indiana, Pa.</i>
Charles Gleason Thomas	AE	104			<i>East Cleveland, O.</i>
Glenn Edward Tollenaar	AI				<i>Spokane, Wash.</i>
Frank Fred Trierweiler	AE	86			<i>Bloomfield, Nebr.</i>
Herman John Trum, Jr.	AE	85			<i>Kansas City, Mo.</i>
Ernest Hugo Trysell	AII				<i>Ann Arbor</i>

Students

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Vernon Leopold Venman	AII	104	<i>Jamestown, N. Y.</i>
Laurence Edward Vilas	AII	4	<i>La Grange, Ill.</i>
Louis Francis Voorhees	AII	22	<i>Toledo, O.</i>
Howard Cleland Waldo	AE	124	<i>Detroit</i>
Lester Harold Waldo	AII		<i>Detroit</i>
Roland Severyne Westbrook	AII	41	<i>Savannah, N. Y.</i>
David Hampson Williams, Jr.	S	41	<i>Duluth, Minn.</i>
George Henion Williams	AII	32	<i>Detroit</i>
Harold Edson Wilson	AII	3	<i>Longmont, Colo.</i>
Joseph Ross Wilson	AII		<i>Sault Ste. Marie</i>
Barton Dixon Wood	AII	107	<i>Merced, Cal.</i>
Harold Nellis Young	AII		<i>Detroit</i>

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 THEOPHIL KLINGMANN, Ph.C., M.D.
 FREDERICK R. WALDRON, Ph.B., M.D.
 JAMES G. CUMMING, M.D.
 ROY W. PRYER, Ph.C., M.S.
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 ROBERT L. NOVY, A.B.
 WILLIAM R. VIS, B.S.
 DAMON O. WALTHALL, B.S.

STUDENTS***RESIDENT PRACTITIONERS**

James Franklin Adams, M.D.	<i>Ann Arbor</i>
<i>College of Physicians and Surgeons</i>	
George Edwards Fay, B.S., M.D.	<i>Detroit</i>
Hal Morgan Parker, M.D., <i>Detroit College of Medicine</i>	<i>Monroe.</i>
Carroll Dunham Partridge	<i>Augusta, Ga.</i>
<i>B.S. University of Vermont</i>	
<i>M.D. Johns Hopkins University</i>	
Walter Karthalo Rexford, A.B., M.D.	<i>Ypsilanti</i>
James Townley Upjohn, M.D.	<i>Kalamazoo</i>

* A dagger (†) preceding a student's name signifies that he also pursued studies, for the whole or part of the year, in another Department of the University, indicated by an italic letter following the name, to-wit: g, Graduate Department; a, Department of Literature, Science, and the Arts; e, Department of Engineering; ea, Department of Architecture; l, Department of Law; p, School of Pharmacy; h, Homoeopathic Medical College; d, College of Dental Surgery. The letter following the name (without the dagger), indicates that the student is pursuing a combined course, leading to a degree in each of the two Departments.

FOURTH YEAR STUDENTS

Thomas Carlyle Anderson, A.B., <i>Morningside College</i>	Vincent, Ia.
Roy Edward Henry Baribeau	Grand Ledge
Roy Alexander Barlow, B.S., <i>University of Rochester</i>	Rochester, N. Y.
Harold de Blois Barss, A.B., <i>University of Rochester</i>	Rochester, N. Y.
Leslie Lee Bottsford, A.B., <i>Williams College</i>	Moscow, N. Y.
Aaron Chapman Button, B.S.	Ann Arbor
Lucius William Case, B.S., <i>Pomona College</i>	El Valle, Mex.
Aaron Lee Chapman, B.S.	Walled Lake
Harold Edward Clark, B.S.	Detroit
Grady Edward Clay, B.S., <i>Emory College</i>	Walnutgrove, Ga.
Carl Benjamin DeForest, A.B.	Ann Arbor
Charles Parmelee Drury, A.B., <i>St. Lawrence University</i>	Canton, N. Y.
Joseph Alexander Elliott, Jr., A.B., <i>Southern University</i>	Moundville, Ala.
James Alexander Franklin, A.B., <i>Lincoln University</i>	Knoxville, Tenn.
Quinter Olen Gilbert, A.M.	Ann Arbor
Benjamin Stuart Gntelius, A.B., <i>Williams College</i>	Detroit
Howard Russell Hartman, B.S.	Toledo, O.
Harold Stacey Hulbert	Oak Park, Ill.
William Lafon Jones, B.S., <i>Princeton University</i>	Sebewaing
Charles Leslie Kyner, A.B., <i>Illinois Wesleyan College</i>	Martinsburg, W. Va.
Frederick Howe Lamb	Ann Arbor
John Leonard Lavan	Grand Rapids
Frank Alvin Lawrence, A.B., <i>Grove City College</i>	Grove City, Pa.
Vernon Walker LeMaster, B.S.	Portland, Ind.
James Rubeo Lisa, B.S.	Calumet
Donald E. McPhail	Wilmingtong, O.
Harry Hrand Migerdich Malejan, A.B., <i>Anatolia College</i>	Ann Arbor
A.B.	Pinckney
Frank Augustus Mercer	Ann Arbor
Bryce Alfred Miller, A.B.	Belmont, N. Y.
Frederick TenEycke Munson, B.S.	Shepherd
Arthur Venton Murtha	Coleman
Archibald Claud Pfeiffer, B.S.	Madrid, N. Y.
Foster David Scruton	Salamanca, N. Y.
Francis Eugene Senear, B.S.	Morrice
Milton Shaw, B.S.	Tamaqua, Pa.
Clara Senora Shellhammer, B.S., <i>Bucknell University</i>	Port Huron
Charles George Sinclair, B.S.	Detroit
Angus Price Sutherland, B.S.	Tiffin, O.
Henry Lee Wenner, Jr., A.B.	

THIRD YEAR STUDENTS

Richards Ellison Amos, B.S.	Ironton, O.
Juan Antonio Bonilla, A.B.	Cali, Colombia
Linus Reed Cranmer, B.S.	Steubenville, O.
George James Curry, B.S.	Iron River
Joe DePree, A.B., <i>Hope College</i>	Zeeland
Rachel Eleanor Donnell, A.B., <i>Smith College</i>	West Brookfield, Mass.
Lucy MacMillan Elliott, A.B., <i>Smith College</i>	Binghamton, N. Y.
Bertha Cary Woodhams Ellis, A.B.	Eaton Rapids
Perley B. Exelby, A.B., <i>Albion College</i>	Ann Arbor
Carl Grover Frost, B.S.	Buffalo, N. Y.
Albert Carl Furstenberg	Saginaw
Carl Goehring	Grand Island, Nebr.
William Henry Gordon, B.S.	Findlay, O.
Oliver Herman Heidt, B.S.	Detroit
John Augustus Herring, Jr., A.B., <i>Georgetown College</i>	Georgetown, Ky.
Frank Park Hunter, B.S.	Williamsport, Ind.
Zeno Leo Kaminski, A.B., <i>Detroit College</i>	Detroit
Charles Reuben Keller, B.S.	Ann Arbor
Ezra Edwin Koebbe, B.S.	Manchester
Rollan William Kraft, B.S.	Detroit
Carl Nels Larsen	Alpena
Walter Ivan Lillie	Grand Haven
Maurice Rosenthal Lohman, A.B.	Fort Wayne, Ind.
Henry Eugene McClenahan	Sharon, Pa.
Martha Marie Matson, A.B., <i>Washburn College</i>	Beloit, Kans.
George Manting	Grand Haven
Phil Lewis Marsh, A.B.	Jackson
Frederick Cleland Mayne	Charlevoix
Nelson Allen Myll, B.S.	Roseville
Ezekiel Edward Nelson, A.B., <i>Wilberforce University</i>	Detroit
Charles Samuel Pascoe	Alpena
Monroe Patterson, A.B., <i>Fisk University</i>	Saint Louis, Mo.
Alonzo Bond Persley, A.B., <i>Lincoln University</i>	Macon, Ga.
Ray Arthur Pinkham	Ann Arbor
Avery DeHart Prangen, B.S.	Hornell, N. Y.
Clara Adelaide Sargent, A.B., <i>Bessie Teft College</i>	Valdosta, Ga.
Robert Felix Schanz	Fort Wayne, Ind.
Lester Charles Scully	Santa Clara, Cal.
John Wesley Sherrick, B.S.	Bowen, Ill.
Alonzo Covert Smith, A.B.	Wooster, O.
Orlow Chapin Snyder, A.B., <i>Indiana University</i>	Rockport, Ind.
Stanley Allison Stealy	Charlotte
George Douglas Sutton, B.S., <i>Alma College, A.M., Columbia University</i>	Caro
Oscar M. Unger, B.S.	Dundee
Buell Hitchcock Van Leuven	Mount Pleasant

George Van Rhee, B.S.	Hudsonville
William R. Vis, B.S.	Zeeland
Kathalyn Voorhis, A.B., <i>Bucknell University</i>	Ann Arbor
Damon Orian Walthall	Paola, Kans.
Sherman Carl Ward	Alexandria Bay, N. Y.
Marshall Agnew Welbourn, B.S.	Union City, Ind.
Ross Luverne Zimmerman, Ph.C., B.S. (Pharm.)	Albion, Nebr.

SECOND YEAR STUDENTS

Walter Crawford Adams, a	Lodi, Cal.
Cornelius J. Addison	Grand Haven
Govind Venkatesh Ankliker, M.C., <i>College of Physicians and Surgeons, Calcutta</i> , P. S. <i>ibid</i>	Bilgi, Bombay, India
Effie Elisabeth Arnold, a	Detroit
William Harold Ayres	Lorain, O.
Robert Harper Baker, A.B.	Bay City
Edgar Beardslee, a	Pontiac
Myron George Becker, a	Benton Harbor
Diego Abraham Biascoechea, a	San Juan, P. R.
Margaret Helen Bigby, A.B., <i>University of South Carolina</i>	Columbia, S. C.
Morton Emmons Brownell, a	Oneonta, N. Y.
Lona Jelena Zell Bulyea, A.M., <i>Acadia University</i>	Vancouver, B. C.
Artemio Enrique Burbano, Ph.B., <i>Seminary College</i> , B.L., <i>ibid</i>	Pasto, Colombia
Duncan Campbell, a	Munising
George Frederick Carson	Ann Arbor
Clarence Arthur Christensen, a	Detroit
Harry Clayton Cowan, a	Walla Walla, Wash.
Fred Plumer Currier, a	Yale
Mihran Krikor Deirmenjian (Miller), A.B., <i>Anatolia College</i>	Detroit
John Otto Dieterle, a	Ann Arbor
Max Dobrin, a	Montclair, N. J.
Sam Wright Donaldson, A.B., <i>University of Tennessee</i>	Rockford, Tenn.
William Matthew Dugan, Ph.B., <i>Brown University</i>	Fishkill, N. Y.
Anna Gertrude Dumont, A.B., <i>Vassar College</i>	West Coxsackie, N. Y.
William Ross Eaton, B.S., <i>McMinnville College</i>	Mulino, Ore.
Carl Walter Eberbach, A.B.	Ann Arbor
William John Egan, a	Hurley, Wis.
Mary Fisher, A.B., <i>Vassar College</i>	Greensburg, Pa.
Hazel Freed, Ph.B., <i>Wooster University</i>	Wooster, O.
L. A. Funk	Athens
Evan Griffith Galbraith, B.S., <i>Valparaiso University</i>	Brooksville, Ky.
Julius Stanley Shrouds Gardner, a	Harbor Springs
John Lee Gates, a	Ann Arbor
Harry Clifford Gebhart, B.S., <i>Knox College</i>	Galesburg, Ill.

Harry Clark Hackman	Brush Valley, Pa.
Fred Hazard Harrison, A.B., <i>Albion College</i>	Detroit
Harold Henderson, a	Detroit
James Henry Hilburn, A.B., <i>Lincoln University</i> , Ph.C.	
	Waxahachie, Tex.
Dean Henry Jeffers	Wausau, Wis.
Hubert Rudolph John, a	Ann Arbor
Ladislaus Roman Kaminski, A.B., <i>University of Detroit</i>	Detroit
Herbert Francis Kenny, A.B.	Duluth, Minn.
Lyle Boyle Kingery, a	Buchanan
Avedis Hovanes Kouyoumjian (Kouyoumjian)	Dorchester, Mass.
Anthony Henry Lange, a	Detroit
Lorenzo Brown Lapsley, A.B.	Portland, Ore.
Henry Allen Lichtig, a	Mount Clemens
Marjorie Juline Lord, a	Montreat, N. C.
Holton Murschamp Lowe, A.B., <i>Ohio Wesleyan University</i>	
	Norwalk, O.
George Vincent Lynch, a	Winona, Minn.
Horace Raymond Lyons	Joliet, Ill.
John Roscoe McNutt	New Bethlehem, Pa.
Ramachandra Venkatesh Nadgir, Kop	Bombay, India
Earl Wilfred May	Detroit
Loren Kenneth Meredith	Ottumwa, Ia.
Harold Abiud Miller, a	Lansing
Edmund Christopher Mohr, a	Bay City
Charles Arthur Mooney	Curtisville, Pa.
Helen Annette Moore, A.B.	Carthage, Ill.
William Porter Norcom, A.B., <i>Yale University</i>	New Haven, Conn.
John Jeremiah O'Leary, a	Muskegon
Mariano Ramon Pesquera	San Juan, P. R.
Paul Henry Piper, a	Alamo
John Ryer Poppen	Athenia, N. J.
Roland Winfield Riggs	Brookville, Pa.
James Floyd Runner, a	Grand Rapids
James Bradford Seeley, a	Detroit
Harold William Shutter, e	Grand Rapids
Howard Lee Smallman, a	Ellicottville, N. Y.
Robert James Snider, Jr., a	Wheeling, W. Va.
Karl Sutherland Staatz	Tacoma, Wash.
Clair Lazuras Stealy	Charlotte
Louis Desenberg Stern, A.B.	Kalamazoo
William Manning Tappan, A.B., <i>Mercer University</i>	
	White Plains, Ga.
Lester Claire Todd, A.B., <i>Tabor College</i>	Tabor, Ia.
Warren Taylor Vaughan, A.B.	Ann Arbor
Simon Aloysius Walkowiak, a	Duluth, Minn.
Louis Edward Walsh	Saint Ignace
George Watt, a	Barre, Vt.
Walter Fletcher Watton, a	Fenton

Philip Douglas Werum	Toledo, O.
Herbert Olander Westervelt, <i>a</i>	Ann Arbor
William Westrate, A.B., <i>Hope College</i>	Holland
Josiah Glenn Wilmore, <i>a</i>	Van Wert, O.
Lowell Lorrimer Youngquist, <i>a</i>	Marquette

FIRST YEAR STUDENTS

Floyd Pierpont Allen	Britton
Arthur Lewis Amolsch, <i>a</i>	Laurium
Charles May Newman Anderson, <i>a</i>	Nex Perce, Idaho
Alfred Leston Arnold	Owosso
Dietrich Ludwig Bartling, B.S., <i>Fremont College, B. A., ibid</i>	Herman, Nebr.
Clarence Austin Berge, A.B., <i>University of Washington</i>	Davenport, Wash.
Squire S. Beverly, B.S., <i>Valparaiso University</i>	Ann Arbor
Max A. Blumer, <i>a</i>	Pittsburg, Pa.
Clinton Bernard Brake	Crosby
Warren Conrad Breidenbach, <i>a</i>	Piqua, O.
Laura Agnes Buck, A.B., <i>Syracuse University</i>	Naples, N. Y.
John Thomas Burns, B.L., <i>Notre Dame University</i>	Kalamazoo
Jacob H. Chalot, <i>a</i>	Detroit
Leon Basil Cohen, <i>a</i>	Harrisburg, Pa.
Hermon Harrison Cole, <i>a</i>	Alton, Ill.
Roland Spuhler Cron, <i>a</i>	Manistee
Justin Matthew Donnelly	Ann Arbor
Frank Merle Dryden, A.B., <i>University of Nebraska</i>	Lincoln, Nebr.
David Christian Eisele, <i>a</i>	Albany, N. Y.
Herbert William Emerson, Ph.C., B.S. (Phar.)	Lawrence, Kans.
Mary Josephine Erickson, <i>a</i>	Hancock
Lynn Adelbert Ferguson, <i>a</i>	Sparta
Charles Bennett Fisher, A.B., <i>University of Pittsburg</i>	Washington, D. C.
Walter Abram Fort, <i>a</i>	Centerville
Eva Frazer, A.B., <i>University of Oregon</i>	Eugene, Ore.
August Ernst Gehrke, <i>a</i>	Detroit
Josephine Geiselhart, B.S., <i>University of California</i>	Berkeley, Cal.
Norris William Gillette, A.B., <i>Harvard University</i>	Toledo, O.
William Stephen Gonne, <i>a</i>	Detroit
John Black Grant, A.B., <i>Arcadia College</i>	Ninpho, China
Spencer Dewitt Gay, <i>a</i>	Coloma
Jack Harry Hamill, <i>a</i>	Bolivar, Pa.
Austin William Heine, <i>a</i>	Mount Clemens
Edward Wilcox Hitchcock, A.B., <i>Amherst College</i>	Detroit
Chaunce Orme Hollinger	Bowling Green, O.
Benjamin George Holtom, <i>a</i>	Battle Creek
James Roy Hurley	Cass City
Robert Moffatt Johnstone	Hancock

Jack Walker Jones, A.B., <i>Mercer University</i>	Canton, Ga.
Benjamin Karpman, Ph.G., <i>New York College of Pharmacy</i>	Hampton Falls, N. H.
Sarkis Hovannes Kashkashian	Yongat, Turkey
Rolla George Karshner, <i>a</i>	Big Rapids
Harther Lewis Keim, <i>a</i>	Steelton, Pa.
Harold Lang Kennedy, <i>a</i>	Spokane, Wash.
Karm Chandra Kerwell	Dhesian Kahna, India
Garabed Hagop Kooyumjian, <i>a</i>	Petoskey
Louis Aaron Kustin, <i>a</i>	Cleveland, O.
Roy Lee Laird, <i>a</i>	Spokane, Wash.
Henry Mayor Landesman, Ph.G., <i>Brooklyn College of Pharmacy</i>	Ann Arbor
Bertil Thomelius Larson	Crystal Falls
Joseph Stanley Leszynski	Harbor Beach
Tsoong Ching Lieu, <i>a</i>	Foochow, China
Maurice Clock Loree	Ovid
George McClure, <i>a</i>	Calumet
Robert Bruce Macduff	Jackson
Julian Barnett Marks, <i>a</i>	Oscoda
Thomas Meriwether Marks	Lexington, Ky.
Ermelindo Acisclo Mercado	Juana Diaz, P. R.
Hugh Raymond Meyer, <i>a</i>	Fowler
Vasil Prodromos Moisides, A.B., <i>Anatolia College</i>	Detroit
John Chalmers Montgomery, <i>a</i>	Coldwater
John Wesley Moore, A.B., <i>Wilberforce University</i>	Atlanta, Ga.
John Hulst Müller, <i>a</i>	Grand Rapids
Franklyn Augustus Myers, A.B., <i>Lincoln University</i>	Brooklyn, N. Y.
Laura Nicholson, Ph.B., <i>Kalamazoo College</i>	Ann Arbor
Raymond James Nutting, B.S., <i>Ohio University</i>	McConnellsville, O.
Vincent John O'Connor, <i>a</i>	Ottawa, Ill.
Richard Francis O'Hora, B.S., <i>Hobart College</i>	Geneva, N. Y.
Russell Aaron Alger Oldfield, <i>a</i>	Bay City
Russell Henry Oppenheimer, A.B., <i>Ohio State University</i>	Fremont, O.
Donald Hunter O'Rourke, <i>a</i>	Fort Wayne, Ind.
Algernon Arthur Palmer	Chelsea
Guy Anthony Parillo	Girard, O.
John Purl Parsons, <i>a</i>	Boise, Idaho
Roy Webster Pryer, Ph.C., B.S. (Phar.), M.S.	Portland
Frank Hugh Purcell, A.B., <i>University of Detroit</i>	Detroit
Frank Perryn Raiford, A.B., <i>Lincoln University</i>	Atlanta, Ga.
Cecil DuBois Rainey, A.B., <i>Ohio State University</i>	Mansfield, O.
Stanley Baines Robertson, A.B., <i>Hillsdale College</i>	Hillsdale
Rudolph Hermann Ruedemann, <i>a</i>	Albany, N. Y.
Julius Andrew Ruetenik	Cleveland, O.
Viola Pevey Russell, A.B., <i>Vassar College</i>	Wellesley, Mass.
Edwin Rutherford Scarboro, A.B., <i>Mercer University</i>	Tifton, Ga.
William Benjamin Schallert	Saint Louis, Mo.

Edward Henry Schlegel, <i>a</i>	<i>Fort Wayne, Ind.</i>
Edwin William Schultz, <i>a</i>	<i>Krupp, Wash.</i>
Loren William Shaffer, <i>a</i>	<i>Ligonier, Pa.</i>
Bert H. Shepard	<i>Lake Odessa</i>
Burne Olin Sippy, B.S., <i>Buchtel College</i>	<i>Akron, O.</i>
LeRoy James Smith, <i>a</i>	<i>Monroe</i>
Frank William John Stafford, <i>a</i>	<i>Detroit</i>
Claire LeRoy Straith, <i>a</i>	<i>Detroit</i>
Myra Chase Sturgis, A.B.	<i>Sturgis</i>
Arthur Murray Thompson, <i>a</i>	<i>Grand Rapids</i>
Clarence Elijah Thompson	<i>Sandusky, O.</i>
George Douglas Treadgold	<i>Port Huron</i>
Pangyuen Tseo	<i>Nanchang, China</i>
David Andrew Tucker, Jr., A.B., <i>Parker College, A.M., ibid</i>	<i>Hillsdale</i>
Russell William Ullrich, <i>a</i>	<i>Mount Clemens</i>
Leon Vincent Urbanowski, B.S., <i>Valparaiso University</i>	<i>Peru, Ill.</i>
Theodore Peter VanderZalm	<i>Grand Haven</i>
Rex Edward VanDuzen, B.S., <i>Aima College</i>	<i>Breckenridge</i>
Ralph Marean Vincent, <i>a</i>	<i>Binghamton, N. Y.</i>
Albert DeForest Wickett, <i>a</i>	<i>Mount Pleasant</i>
Hiram Samuel Yellen, <i>a</i>	<i>Buffalo, N. Y.</i>
Pedro Juan Zamora, <i>a</i>	<i>Aguadilla, P. R.</i>

Department of Law

FACULTY

HARRY B. HUTCHINS, LL.D., *President*
BRADLEY M. THOMPSON, M.S., LL.B.
JEROME C. KNOWLTON, A.B., LL.B.
THOMAS C. TRUEBLOOD, A.M.
THOMAS A. BOGLE, LL.B.
VICTOR H. LANE, C.E., LL.B.
JAMES H. BREWSTER, Ph.B., LL.B.
HORACE L. WILGUS, M.S.
ROBERT E. BUNKER, A.M., LL.B.
HENRY M. BATES, Ph.B., LL.B., *Dean*
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EDSON R. SUNDERLAND, A.M., LL.B.
EVANS HOLBROOK, A.B., LL.B.
WILLIS G. STONER, A.B., LL.B.
RALPH W. AIGLER, LL.B.
JOHN B. WAITE, A.B., LL.B.
EDGAR N. DURFEE, A.B.
RICHARD D. T. HOLLISTER, A.M.
WILLARD T. BARBOUR, B.Litt., A.M., LL.B.

SPECIAL LECTURERS

VICTOR C. VAUGHAN, Ph.D., M.D., LL.D.
FRANK F. REED, A.B.
ALBERT H. WALKER, LL.B.
DALIAS BOUDEMAN, M.S.
EDWARD S. ROGERS, LL.B.
LAWRENCE MAXWELL, LL.D.
GEORGE L. CANFIELD, A.B.
CLARENCE A. LIGHTNER, A.B.

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Attendance

DEAN H. M. BATES, PROFESSORS E. C. GODDARD, and V. H. LANE.

STUDENTS***THIRD YEAR STUDENTS**

Samuel Lambert Adelsdorf	<i>Chicago, Ill.</i>
Ray Ellsworth Anderson	<i>Norway</i>
Allen Andrews, Jr., A.B.	<i>Hamilton, O.</i>
David Armstrong, Jr.	<i>Saint Mary's O.</i>
Smith Beach Atwood	<i>Carrollton, Mo.</i>
Russell Ellsworth Baer	<i>Akron, O.</i>
Charles Edward Baker	<i>Jackson, Minn.</i>
Claude Ferris Baker	<i>Manitou Beach</i>
Howard Thornburg Baker	<i>Williamsport, Pa.</i>
Paul Brandon Barringer, Jr., A.B., <i>University of Virginia</i>	<i>Charlottesville, Va.</i>
Benjamin Theodore Batsch	<i>Dunkirk, Ind.</i>
Albert Vogt Baumann, Jr., A.B., <i>Amherst College</i>	<i>Fremont, O.</i>
Rex Beadsley	<i>Boyne</i>
George Howard Beninghoff, B.S., <i>Tri-State College</i>	<i>Butler, Ind.</i>
Thomas Earl Howard Black, A.B.	<i>Ann Arbor</i>
James Palmer Blakeney	<i>Cleburne, Tex.</i>
Francis Willard Bolin, A.B., <i>Hendrix College</i>	<i>Harrisburg, Ark.</i>
Byron Martin Brogan	<i>Ironwood</i>
Frank Vincent Burrows	<i>Marquette</i>
Paul D. Busby	<i>McAlester, Okla.</i>
Thomas Glenn Caley	<i>Lapeer</i>
Charles Campbell, A.B., <i>Fisk University</i>	<i>Chicago, Ill.</i>
Alex Motheral Chaney	<i>Rockfield, Ky.</i>
Roger Edmund Chapin	<i>Springfield, Ill.</i>
Henry Alexander Chapple	<i>Billings, Mont.</i>

* A dagger (†) preceding a student's name signifies that he also pursued studies, for the whole or a part of the year, in another Department of the University, indicated by an italic letter following the name, to-wit: g, Graduate Department; a, Department of Literature, Science, and the Arts; e, Department of Engineering; ea, Department of Architecture; m, Department of Medicine and Surgery; p, School of Pharmacy; h, Homoeopathic Medical College; d, College of Dental Surgery. The letter following the name (without the dagger) indicates that the student is pursuing a combined course, leading to a degree in each of the two Departments.

Clark Eric Clement, A.B., <i>Mercer University</i>	<i>Montrose, Colo.</i>
Arthur Garfield Cohen	<i>Seattle, Wash.</i>
William Harold Collette	<i>Menominee</i>
Percival Meredith Collier, A.B., <i>University of Oregon</i>	<i>Eugene, Ore.</i>
Frederick Miller Cook	<i>Aberdeen, Wash.</i>
Martin Vanburen Cook	<i>Ann Arbor</i>
Sydney Meador Cook	<i>Natchitoches, La.</i>
Paul Martin Cooter	<i>Oklahoma City, Okla.</i>
John William Cory, Jr., A.B., <i>Cornell College</i>	<i>Spencer, Ia.</i>
Burton Briggs Crane	<i>Santa Paula, Cal.</i>
Robert James Curry, A.B.,	<i>Dansville, N. Y.</i>
Harry King Curtis	<i>Topeka, Kans.</i>
Louis Dudley David	<i>Chicago, Ill.</i>
Gordon Davies, A.B., <i>Ohio State University</i>	<i>Marysville, O.</i>
Mark Twain Davis	<i>Saginaw</i>
Roy Gabriel Davis	<i>Mineral Ridge, O.</i>
Peter Matthew Davitt	<i>Northville</i>
Roy Stanley Day	<i>Owosso</i>
Harry Levi Diehl	<i>Ipava, Ill.</i>
William Alvin Diemer	<i>Palmyra, Mo.</i>
Russell Tomlinson Dobson, Jr.	<i>Ann Arbor</i>
Paul Deppen Doherty	<i>Louisville, Ky.</i>
Hubert Asahel Downey	<i>Indianapolis, Ind.</i>
Jay Lionel Downing	<i>Hastings</i>
William Caldwell Dudgeon, A.B.	<i>Saginaw</i>
Fred Hadley Dye, A.B.	<i>Plankinton, S. Dak.</i>
Alfred John Eggers	<i>South Omaha, Nebr.</i>
Edgar Newton Eisenhower	<i>Abilene, Kans.</i>
William George Evenson	<i>Baraboo, Wis.</i>
Karl William Farr, A.B.	<i>Greeley, Colo.</i>
Francis Thomas Findlay	<i>Niagara Falls, N. Y.</i>
Rowland Wells Fixel, A.B.	<i>Detroit</i>
Tom G. Forney, B.S., <i>Ohio Northern University</i> , Ph.B., <i>ibid</i>	<i>Washington, D. C.</i>
John Wesley Fowler	<i>Waterville, O.</i>
Grady Gamble	<i>Clarington, O.</i>
Leland Grisier Gardner	<i>Toledo, O.</i>
Stanley Easton Gifford, A.B. <i>Yale University</i>	<i>Detroit</i>
Frederick Brayton Gilbert	<i>State Center, Pa.</i>
Charles Chepsal Goldman	<i>Cleveland, O.</i>
Willis Bligh Goodenow, A.B.	<i>Detroit</i>
Cyrus John Goodrich	<i>Marshall</i>
Nathan Jacob Gould	<i>Pittsburg, Pa.</i>
Frank Clarence Grant, B.S. <i>Fremont College</i>	<i>Auburn, Nebr.</i>
William Anderson Green	<i>Sacramento, Cal.</i>
Grover Cleveland Grismore, A.B.	<i>Pandora, O.</i>
Sylvan Salmon Grosner, A.B.	<i>Washington, D. C.</i>
Rockwell T. Gust	<i>Morenci</i>
Edward Watson Haislip	<i>Kalamazoo</i>

Henry Cleveland Hall	Helena, Mont.
Louis Patterson Haller, A.B.	Omaha, Nebr.
Artemus Wineman Ham	Los Angeles, Cal.
Justin Woodward Harding	Franklin, O.
James Pardon Harris, A.B., <i>Bucknell University</i> ; A.M. <i>ibid</i>	
	Lewisburg, Pa.
Roy Knight Harris	Frederick, S. Dak.
Abraham Jesse Hart	Mellott, Ind.
Henry Hart	Adrian
M. Waldo Hatler	Neosho, Mo.
John Blakey Helm, A.B., <i>Princeton University</i>	Bowling Green, Ky.
Leonard Ralph Henoch	La Porte, Ind.
Ted Dwight Herndon	Rochester, Ill.
Fred Hinkle	Ashland, Kans.
Charles Harold Hippler, A.B.	Geneseo, Ill.
Collier Allison Hizer	LaPlata, Mo.
Fred Jacob Hoffmeister	Saint Louis, Mo.
Arthur Lloyd Hooper	Canton, O.
Fred Chalmers Houston, A.B., <i>Westminster College</i>	Darlington, Pa.
Clarence John Hoyt	Youngstown, O.
Clair Brinton Hughes, A.B.	Toledo, O.
Lyman Spaulding Hulbert	Ann Arbor
Fenton Hume, B.S., <i>Fremont College</i>	Thurman, Ia.
Tzon Fah Hwang	Nanking, China
Clarence Elmo Jamison	Pontiac, Ill.
John Henry Jay	Shenandoah, Ia.
Walter P. Jensen	Pocahontas, Ia.
Charles William Johnson	Tacoma, Wash.
David Cecil Johnson, A.B.	Ann Arbor
Victor Howard Johnson	Norway
Elroy Osborne Jones	Ann Arbor
John Beverley Jones	Duluth, Minn.
Orville Reid Jones	Seaton, Ill.
Arthur Dewitt Kehoe	Detroit
John Samuel Kelley, Jr., <i>St. Mary's College</i>	Bardstown, Ky.
Spencer Dix Kelley, A.B.	Mount Pleasant
Victor Louis Kelley, A.B., <i>St. Mary's College</i>	Bardstown, Ky.
Edward Gearing Kemp, A.B.	Saint Clair
George Edward Kennedy, A.B., <i>Princeton University</i>	
	Naugatuck, Conn.
Daniel Eugene Kervin	Bradford, Pa.
Attix Haywood Kinch	Port Huron
George Bowman Kingston, A.B.	Croswell
Carl Hubbard Kleinstuck	Kalamazoo
Louis Raymond Lackey, Litt.B., <i>Princeton University</i>	
	Uniontown, Pa.
William John Laidlaw	Portland, Ore.
William M. Laird	Tyrone, Pa.
Wilber Edwards Lamb	Gibson City, Ill.

Arthur Francis Lamey	<i>Havre, Mont.</i>
Paul Thomas Landis, A.B.	<i>Huntingdon, Pa.</i>
Clarence Emanuel Lehr	<i>Escanaba</i>
John Victor Lewis	<i>Lavina, Mont.</i>
David Benjamin Lichtig, A.B.	<i>Bay City</i>
Raymond Alfred Liggett	<i>Peoria, Ill.</i>
Harry Wood Lippincott, A.B., <i>Washington and Lee University</i>	<i>Flint</i>
Theodore Laurence Locke	<i>Linneus, Mo.</i>
Charles Augustus Lorenzo	<i>Punxsutawney, Pa.</i>
Henry Griffith Lumbard	<i>Seattle, Wash.</i>
Thomas Friend McCoy, Ph.B., <i>Grove City College</i>	<i>Grove City, Pa.</i>
Colonel Blake McDowell	<i>Akron, O.</i>
John Robert McFie, Jr.	<i>Sante Fe, N. Mex.</i>
Ralph Charles McLaughlin	<i>Archbold, O.</i>
Jay Frederick McMullen, A.B., <i>Bethany College</i>	<i>Addison, Pa.</i>
John Arthur McNeil, A.B.	<i>Ann Arbor</i>
Archie Webster McRaney	<i>Collins, Miss.</i>
Verner Wright Main, A.B., <i>Hillsdale College</i>	<i>Niles</i>
David Benjamin Maloney	<i>Arcadia, Wis.</i>
George Edward Matthews, A.B.	<i>Library, Pa.</i>
Donald Franklin Melhorn, A.B.	<i>Kenton, O.</i>
Joseph Bernhardt Meyers	<i>Chicago, Ill.</i>
William J. Millar, Jr.	<i>Springfield, Ill.</i>
Daniel Washington Miller, Jr.	<i>Beaver, Pa.</i>
Norman James Miller, B.S., <i>University of California</i>	<i>Bay City</i>
Grover Lake Morden	<i>Saginaw</i>
Leland Albert Morris	<i>Cartersville, S. C.</i>
James Edward Mourn	<i>Akron, O.</i>
George Herbert Muckley	<i>Kansas City, Mo.</i>
Thomas Carlton Mullen	<i>Michigan City, Ind.</i>
Earl Milham Mumford	<i>Howard, S. Dak.</i>
Frank William Murphy	<i>Harbor Beach</i>
Charles Curtis Murrah	<i>Creal Springs, Ill.</i>
James Coburn Musser	<i>Akron, O.</i>
Henry Cleveland Myers	<i>Elgin, Ill.</i>
Maurice Clark Myers, A.B.	<i>Ann Arbor</i>
John Kubler Nece	<i>Fairview, Pa.</i>
John Rudolph Ober	<i>Soledad, Cal.</i>
Seldon W. O'Brien, B.S., <i>Ohio Northern University</i>	<i>Hemlock Grove, O.</i>
John Paul O'Hora	<i>Geneva, N. Y.</i>
Carlton Thompson Olds	<i>Edwardsburg</i>
Norris Goodrich Olney	<i>Marathon, Ia.</i>
William Percy	<i>Scottdale, Pa.</i>
John Philip Perry, A.B., <i>Oberlin College</i>	<i>Jefferson, O.</i>
Clifford Fuller Phillips	<i>Beatrice, Nebr.</i>
Floyd Melvine Phinney	<i>Kalkaska</i>
Robert Morey Pierson, A.B.	<i>Paxton, Ill.</i>

Harold John Plunkett	Lowville, N. Y.
Miller Hall Pontius	Circleville, O.
Roswell Olcott Post, Jr., A.B., Dartmouth College	Jacksonville, Ill.
Percy Lester Potter	Big Rapids
Russell Hamilton Campbell Proffitt	Altoona, Pa.
Bland Allen Pugh	Webb City, Mo.
Cregar Brough Quaintance	Golden, Colo.
Goodloe Harold Rogers	Pontiac
Francis Samuel Rosenthal	Ann Arbor
Henry Philip Seaborg	Ironwood
Edward MacGlen Sharpe	Bay City
Frank M. Shepard	Goshen, Ind.
Benjamin Otto Shepherd	Detroit
Blaine Brown Shinumel, A.B.	Grand Rapids
Nathaniel Porter Sims	Bowling Green, Ky.
Richard Manson Skinner	Princeton, Ill.
Ralph Monroe Snyder, A.B.	Decatur, Ill.
Thomas Frederick Sotham	Lake George
Roger Wayland Spencer	Duluth, Minn.
Hubert Victor Spike	Gladwin
William Franklin Spikes	Pocahontas, Ark.
Harold Hoover Sprigle	Akron, O.
Garret Stelsel	Wausun, Wis.
Frank Lawrence Stephan, A.B.	Andrews, Ind.
William B. Stewart	Waynesburg, Pa.
Emil Emanuel Storkan	Battle Creek
Spencer Wesley Symons, A.B., University of Wyoming	Laramie, Wyo.
Emil Albert Tessin	Hemlock
Matthew Hosmer Tinkham, A.B.	Romulus
Maurice Lloyd Toulme, A.B.	Odin, Ill.
Duane Leggett Tower	Niagara Falls, N. Y.
Virgil Benjamin Tupper	Corning, N. Y.
Samuel Rutherford Turner, A.B., Illinois College	Virginia, Ill.
Donald Vanderveer	Milford, Ind.
Fred Leon VanDolsen	Warren, Ind.
Alfred Grant Walker	West Springfield, Pa.
Stuart Sipley Wall	Cadillac
Martin John Wannemacher	Ottoville, O.
Boaz Benjamin Watkins	Saint Louis, Mo.
Charles S. Weintraub	Canton, O.
Edward Oak West	Hasbrouck Heights, N. J.
Randolph Philip Whitehead	Morenci
Irvin Leslie Wilson	Ava, Ill.
John Currie Winter, A.B.	Detroit
Seibert Day Wise	Eldorado, Ill.
Joseph Timothy Witherow, Ph.B., Brown University	Pawtucket, R. I.
Lorenzo Kenna Wood, A.B.	Princeton, Ky.

Claude Jesse Woodard
 Francis Marion Woodard
 Edgar Monroe Wright
 Frank Arthur Wright
 Clyde Elmer Zachman

Montezuma, Ind.
 Safford, Ariz.
 Logan, Utah
 Lewistown, Mont.
 North Yakima, Wash.

SECOND YEAR STUDENTS

Thomas Ernest Agee
 Robert Mintie Alton
 Claude Annan
 William James Aplington
 Helmuth Frederick Arps
 George Andrew Beis, A.B.
 Leland Stanford Bisbee, A.B.
 William Franklin Black, A.B.
 Harry David Boardman
 Henry Charles Bogle
 John Stanley Books
 Budd B. Boose
 Joseph Francis Boyle
 Frank J. Browbaker
 Murphy John Broussard, A.B., *Jefferson College*
 Marcy Kent Brown, Jr., A.B., *University of Missouri*

Wells, Nev.
 Livingston, Mont.
 Clarinda, Ia.
 LaSalle, Ill.
 New Holstein, Wis.
 Sandusky, O.
 Port Hope
 Mansfield, O.
 Jackson
 Ann Arbor
 Detroit
 Somerset, Pa.
 Duluth, Minn.
 Altamont, Ill.

Wilbur Devere Bryant
 Charles William Burton
 Elmer Edwin Carlson
 John Gottfrid Cedergren, A.B., *Gustavus Adolphus College*
 Garvin Dunn Chastain
 Lewis Gus Christman, A.B., *Olivet College*
 John Randolph Clarke
 Eugene Solis Cohn
 Fenn Hesden Cooney, B.S. (C.E.), *Iowa State College*

Kansas City, Mo.
 Lansing
 Edwardsville, Ill.
 Kingsburg, Cal.
 North Branch, Minn.
 Chickasha, Okla.
 Ann Arbor
 Mount Pleasant
 Spokane, Wash.

Clark Claire Coulter
 John Stewart Crawford, Ph.B., *Wooster University*
 Albert Warren Dann, A.B. *University of Nebraska*
 Charles Davidson
 Selden Stratton Dickinson, A.B.
 Cyril Edward Donnelly
 Toliver Mac Downing
 Thomas James Doyle, A.B.
 Arend Van der Veen Dube, A.B.
 Charles Walker Ferguson
 Fred Barnhart Foulk, A.B.
 Donald Robert French
 Paul Milford Godehn
 Nathaniel H Goldstick

Coon Rapids, Ia.
 Charlevoix
 Toronto, Ont.
 Lincoln, Neb.
 Great Falls, Mont.
 Jackson
 Ann Arbor
 Macomb, Ill.
 Duluth, Minn.
 Beloit, Wis.
 Wayne, W. Va.
 Ann Arbor
 Indianapolis, Ind.
 Moline, Ill.
 Detroit

Benjamin Harrison Gordon	Whiting, Ind.
Edward Leon Gove	Milan, O.
Otto Adolph Graser	Springfield, Ill.
Morley Griswold, A.B.	Elko, Nev.
Carroll Barse Haff, A.B.	Kansas City, Mo.
Levi Marion Hall	Minneapolis, Minn.
John Valentine Hammersmith, A.B.	Massillon, O.
Victor Hugo Hampton	Charlevoix
Herbert Hollis Harshman, A.B.	Manistique
Harold Wilbur Haviland	Omaha, Nebr.
Charles Joseph Hilkey, A.B., <i>College of Emporia; A.M., University of Kansas; Ph.D., Columbia University</i>	Scranton, Kans.
Leslie Roberts Himes	New Bethlehem, Pa.
Oscar Taylor Hinton	Paris, Ky.
Alexander Mayor Hitz	Washington, D. C.
Claude Hollis Hogan	Carrollton, Ga.
O. Z. Ide	Kalamazoo
Emra DeWitt Jaqua, Jr., A.B.	Ann Arbor
Henry Warren Jones	Manchester, N. Y.
Frederick Johnston Kennedy, A.B.	Detroit
William George Kerr, A.B.	Cleveland, O.
Theodore George King	Sault Ste. Marie
Leslie Henry Kranz	Omaha, Nebr.
William O'Neill Kronner	Port Huron
Max Paul Anton Kuhr, A.B.	Chinook, Mont.
Benjamin Simon Leiserwitz	Herscher, Ill.
Arthur Richard Lewis, A.B.	Anna, Ill.
Hugh Edward Lillie	Grand Haven
Percy Morgan Lovett	Miles City, Mont.
Leslie Clarence McClelland	Calumet
George Frederick McGraw	Jackson
Joel Thomas McIntyre	Ann Arbor
Thomas Willard McIntyre	Mackinac Island
Walter Ingles McKenzie	Ann Arbor
Russell Arthur McNair, A.B.	Brown City
David L. MacTaggart, A.B., <i>Valparaiso University</i>	Ann Arbor
Solomon Waldheimer Marx	Louisville, Ky.
Henry Harrison Mead, B.S., <i>Valparaiso University</i>	Valparaiso, Ind.
Vilroy Cole Miller, B.L., <i>Princeton University</i>	Livingston, Mont.
Milton Ernest Mills	Point Sanilac
Karl John Mohr, A.B.	Pekin, Ill.
Henry William Muller, A.B.	Fort Wayne, Ind.
Thomas Fadden Murphy	Olyphant, Pa.
Harry George Neff, A.B., <i>Wabash College</i>	Virginia, Minn.
George Reed Nixon	Springfield, Mo.
Harold LeGrand Nutting, A.B.	McConnelsville, O.
Roswell B. O'Harra	Carthage, Ill.
Ward Harrison Peck	East Jordan
Harry Pell	Plainwell

James Arthur Phelps	Golconda, Ill.
LeRoy Gardiner Pilling, A.B., <i>Brown University</i>	Providence, R. I.
Russell Honore Pray	Kansas City, Mo.
Allen Martin Reed, A.B.	Riverside, Ill.
Henry Hulitt Roberts	Ford City, Pa.
Will Richard Roberts	Calumet
Benjamin Robinson	Detroit
Julian Paris Rodgers, A.B.	Montgomery, Ala.
Erwin John Roller	Jackson
Saverio Rosato, A.B.	Old Forge, Pa.
Samuel Jacob Rosenstein	Detroit
Warwick Inman Rowland	Columbus, O.
Harry Earle Russell, A.B.	Battle Creek
Rayburn Lackland Russell	Pekin, Ill.
Edward Herbert Saier	Lansing
Carl Gustave Schoeffel, A.B.	Freeport, Ill.
Harold Reginald Schradzki	Peoria, Ill.
Finley Dornan Scott	Burgettstown, Pa.
James Thomas Sloan	Colorado Springs, Colo.
William Jacob Sprow, A.B., <i>Wabash College</i>	Crawfordsville, Ind.
John Clarence Stephens	Niles, O.
John Valentine Sweeney	Jacksonville, Ill.
Colon Monroe Tenny, Ph.B., <i>Kalamazoo College</i>	Fenton
Bradley Morris Thomas, A.B., <i>Colorado College</i>	Sante Fe, N. Mex.
James Reginald Thomas	Detroit
Edwin Rice Thurston, A.B.	Toledo, O.
Fermin Sarmiento Torralba	Tagbilaron, Bobol, P. I.
Carey Jacob Tremmel	Ann Arbor
James Guerber Tucker, Jr.	Mount Clemens
Aubrey James Voorhees, A.B., <i>Bowdoin College</i>	Batavia, N. Y.
Eugene Stilson Wells	Oklahoma City, Okla.
William Walter Wheatley, A.B.	Harrisburg, Ill.
Edward Morris Whitlock	Caro
Homer Richards Williams	Jackson, Mo.
Bourke Cochran Wilmot	Gladwin
Otto Giles Wismer	Bay City
Earl Salisbury Wolaver, A.B.	Owosso
†James Jacob Wolfe, a	Lafayette, Ind.

FIRST YEAR STUDENTS

Harry Simon Adler	Kansas City, Mo.
Glen Dale Aldrich	Schenectady, N. Y.
Hugh Guthrie Allerton, a	Ann Arbor
Brodie Tew Atwater	Ann Arbor
Harry Allen Babcock	South Dayton, N. Y.
Arthur John Bancroft	Detroit
George Ayres Barnes	Wells, Minn.
Lawrence Daniel Bartlett	Scotts Bluff, Nebr.
Harvey Teed Bassett	Detroit

†Frederick G. Beattie, <i>a</i>	Toledo, O.
Harry L. Bell, <i>a</i>	Balbec, Ind.
Judson Pierce Best	Dillon, Mont.
James Arnold Blackwood	Detroit
Virgil Lowrie Blanding	Moline, Ill.
Howard Donald Brown, Ph.B. <i>Mt. Union College</i>	Alliance, O.
Robert O. Brownell	Westfield, Pa.
John Gairnes Bruce	Detroit
Louis Mason Bruch	Wilmette, Ill.
Wilber Marion Brucker	Saginaw
Robert Butler	Ann Arbor
Benjamin Franklin Caffey, Jr.	Salt Lake City, Utah
Russell Dean Calkins, A.B., <i>University of Oregon</i>	Eugene, Ore.
John Curtis Campbell	L'Anse
Murl Clio Carlton, A.B., <i>Buena Vista College</i>	Early, Ia.
Manson Charles Carpenter	Ann Arbor
Elbert Armstrong Carter, <i>a</i>	Defiance, O.
Rob Roy Cerney	Manly, Ia.
George Hall Chaney, A.B., <i>Yale University</i>	Detroit
Gaylord H. Chizum, <i>a</i>	Ann Arbor
Lyle Minar Clift, <i>a</i>	Bay City
†Gerald Conlin, <i>a</i>	Adrian
George Stutzman Cooper	Johnstown, Pa.
Lewis Downey Cooper	Hot Springs, Ark.
Glen Lincoln Cowing, <i>a</i>	Joliet, Ill.
Paul Harvey Cunningham, <i>a</i>	Indiana, Pa.
Ralph Erskine Cunningham	Benton Harbor
Oreo R. Deahl	Goshen, Ind.
Arthur Stewart Denis	Green Bay, Wis.
Laurence Albert DeRoy	Pittsburg, Pa.
James Leonard Donnelly	Sedalia, Mo.
Glover Elijah Dowell	LaBelle, Mo.
†Ralph Edwin Dunham, <i>a</i>	Pulaski
Louie Heber Dunten, <i>a</i>	Huntertown, Ind.
Paul Groff Eger	Bay City
Edith Van Marter Ely	Ann Arbor
William Evan Essery	Ann Arbor
Keith Robert Ferguson	Boise, Idaho
Tom Alden Ferris	Ann Arbor
Ellsworth Weaver Finkle, A.B., <i>Drake University</i>	Des Moines, Ia.
Maurice Russel Fitts	Kansas City, Mo.
Carl Folks	Pulaski
Marshall Warren Foote, <i>a</i>	Erie, Pa.
Joseph Foran	Joliet, Ill.
Gerald Sharpe Frary	Great Falls, Mont.
Martin H. Galt	Shenandoah, Ia.
Noah Benjamin Gilliom	Berne, Ind.
William Gardner Godwin	Fort Worth, Tex.
Abner Harry Goldman	Cleveland, O.

William Joseph Goodwin	Louisville, Ky.
John Kingsley Gould, <i>a</i>	Battle Creek
Durward Grinstead, <i>a</i>	Louisville, Ky.
†Howard Haynes Hallowell, <i>a</i>	Kearney, Nebr.
Peter Andrew van Hartesveldt, <i>a</i>	Grand Rapids
Earl Wilmot Hartt	Bloomington, Nebr.
Jesse James Herr, Ph.B., <i>Notre Dame University</i>	Chatsworth, Ill.
Edward Wolcott Hoffman	Kansas City, Mo.
Thomas Hartsook Hood	Columbia City, Ind.
Eerde William Hoogsteen, <i>a</i>	Grand Rapids
Harry Robert Horner	Pierre, S. Dak.
David Samuel Horwich	Chicago, Ill.
Ralph Doane House, <i>a</i>	Brookston, Ind.
Thomas Wellington Hughes	Toledo, O.
Walter S. Hutchison	Scott, O.
Adna Romulus Johnson, Jr., <i>a</i>	Ironton, O.
Harry Emmanuel Johnson, <i>a</i>	East Lake
William McKeehan Johnston, A.B.	Valparaiso, Ind.
Wallace Fuller Judd, A.B., <i>Princeton University</i>	Warren, O.
Zachariah Justice	Callettsburg, Ky.
Nathan Maurice Kaufman	Youngstown, O.
John Alphonso Keane	Amsterdam, N. Y.
†Carl Adolph Keller, <i>a</i>	Cleveland, O.
Sidney Morris Keller	Saginaw
David Francis Kennedy, Ph.B., <i>Lafayette College</i>	Youngstown, O.
Robert Edward Kennington	Indianapolis, Ind.
Roland John Klingler	Lead, S. Dak.
†Albert John Kranz, <i>a</i>	Toledo, O.
William Edward Lamoreaux	Battle Creek
Pearl T. Lanker, A.B., <i>Ohio Northern University</i> ; B.S., <i>ibid</i>	Sycamore, O.
Henry Donald Lawrence	Boulder, Colo.
John Schaack Leonard	Gowanda, N. Y.
Aaron Levinson	Birmingham
Robert Lee Lewis	Ann Arbor
Harold Courtney Ludlum	Michigan City, Ind.
Eugene Russell McCall, A.B., <i>Harvard University</i>	Winterset, Ia.
Buell McCash, A.B., <i>Drake University</i>	Bloomfield, Ia.
Edward Everett McConahy, Ph.B., <i>Grove City College</i>	New Wilmington, Pa.
Oscar Walter McConkie	Moab, Utah
Landis Dudley McDowell, <i>a</i>	Kansas City, Mo.
Frank Martin McHale	Logansport, Ind.
Francis Fowler McKinney	Washington, D. C.
Myron McLaron, <i>a</i>	Chelsea
Daniel Edward McLaughlin	Helena, Mont.
Thomas Richard McNamara	Mount Pleasant
John Dougald MacNaughton	Grand Rapids
Morris Chapman Madison	Ann Arbor

Charles Barber Marks, <i>a</i>	Detroit
William Fish Marsteller	Richmond, Ky.
Edward Stephen Martin, A.B., <i>Lake Forest University</i>	Carthage, Ill.
Albert Alexander Mattson	Lead, S. Dak.
John Cyril Melaniphy	Chicago, Ill.
Leon Daniel Metzger, <i>a</i>	Idamar, Pa.
Albert John Mickelson	Calumet
Frank Gurnee Millard, <i>a</i>	Corunna
William Leslie Miller, A.B., <i>Mt. Union College</i>	North Benton, O.
Ray Jackson Mills	Anamosa, Ia.
Walter Stegeman Moore	Allegan
Oscar David Morrill	Ann Arbor
Walter Edmund Morris, B.S., <i>Oregon State Agricultural College</i>	Punxsutawney, Pa.
Chester James Morse	Jasper
William Clinton Mullendore, <i>a</i>	Howard, Kans.
Chester LeVern Muller	Spokane, Wash.
Richard Strobach Munter	Spokane, Wash.
Russell Hugh Neilson, <i>a</i>	West Branch
†Bonneville Lon Neis, <i>a</i>	Detroit
†Charles Samuel Neithercut, <i>a</i>	Clare
†William Aaron Neithercut, <i>a</i>	Clare
James Kennedy Nichols, A.B., <i>Olivet College; Ph.B. University of Chicago</i>	Ionina
John Rutherford Nicholson	Springfield, Ill.
Roy Alan Nord, B.S., <i>South Dakota State College</i>	Brookings, S. Dak.
Donald Wann Ogilbee	Manitou, Colo.
Irwin Stanley Olson	Chicago, Ill.
Herbert D. Oppenheimer	Saint Joseph, Mo.
†Howard Alvin Orr, <i>a</i>	Circleville, O.
Walter Williams Paisley	Dubuque, Ia.
Harry Dexter Parker	Kankakee, Ill.
Earl Leader Phillips	Marlette
Barnard Pierce, <i>a</i>	Lansing
Willis Thompson Pierson	Milwaukee, Wis.
Maxwell Irving Pitkin	Ravenna, O.
John James Poleski	Albion
Clarence Frederic Poole	Winnetka, Ill.
Herbert Jennings Potter	Ishpeming
John Lawrence Primrose, A.B.	Indianapolis, Ind.
Harry Rabinowitz, <i>a</i>	Eveleth, Minn.
Hollace Moscow Reid, A.B., <i>Roanoke College; A.M., Princeton University</i>	Oriskany, Va.
Robert Earl Richardson	Udly
Oscar Rieger	Kansas City, Mo.
Everett Hale Roan	Pasadena, Cal.
Lloyd Walter Robinson, Jr.	Forsythe, Mont.
John Rough, Jr.	Negaunee
Clyde Christopher Rowan	Buffalo, Kans.

Rowe Rudolph	Pueblo, Colo.
Henry Carl Rummel, <i>a</i>	LaPorte, Ind.
Michael Mackay Ryan, A.B.	Brimley
James Harvey Sallee, <i>a</i>	Covington, Ky.
LeRoy Joseph Scanlon	Johnstown, Pa.
Benjamin Harry Schaphorst, B.S., <i>South Dakota State College</i>	
	Brookings, S. Dak.
Adolfo Asuncion Scheerer	Pasay, Rizal, P. I.
Albert Erwin Schrimpf	Spokane, Wash.
Werner William Schroeder, <i>a</i>	Kankakee, Ill.
John Frederic Scott	Saint Cloud, Minn.
Malcolm McCormick Scott	Connellsville, Pa.
Stanley Sevier	Eureka, Cal.
Max Charles Seyfert, Jr.	Circleville, O.
Will Shafroth, <i>a</i>	Denver, Colo.
Samuel Shapero, <i>a</i>	Bay City
Ralph Gardiner Shelden	Ann Arbor
William McKay Skillman	Oxford
Harry Seger Slifer, A.B., <i>Wesleyan University; A.M.</i> ,	
	Greenfield, Ind.
Donald Roscoe Spencer, <i>a</i>	Ann Arbor
Laurence Mason Sprague, <i>a</i>	Ann Arbor
James Geddes Staley, A.B.	Battle Creek
Lowell Randall Stark	Norwich, Conn.
Walter Joseph Stein	Chicago, Ill.
Kenneth Marco Stevens	Detroit
Perry Howard Stevens	Ravenna, O.
Donald F. Stiver	Goshen, Ind.
Harry Blair Sutter, <i>a</i>	Indiana, Pa.
Clarence Arthur Swainson	Cheyenne, Wyo.
Warren Edward Talcott	Livingston, Mont.
Harold Chester Tallmadge, <i>a</i>	Denver, Colo.
James Francis Tallman	Bellaire, O.
George Richard Tandler, <i>a</i>	Ann Arbor
Theodore Hawley Tapping, A.B., <i>State University of Iowa</i>	
	Peoria, Ill.
Murphy Oswald Tate	Somerset, Ky.
Edward Earl Taylor, A.B.	Chicago, Ill.
Elmer Allen Taylor, Ph.B., <i>Ohio Northern University</i>	Watseka, Ill.
Oscar Balthaser Thiel, <i>a</i>	Pigeon
Isaac Lash Thomas	Constantine
Paul Frye Thompson	Bay City
Kent Hampden Thornell	Sidney, Ia.
Frederick Woodward Voorheis	Grand Rapids
Frank Christopher Wagner	Battle Creek
Donald Alexander Wallace	Detroit
Kung-kuan Wang	Shanghai, China

†David John Wanless, <i>a</i>	Marquette
Harold Jiroux Waples	Ironwood
Charles Pierre Wattles, <i>a</i>	Fowler, Ind.
Maurice Weinberger	Kansas City, Mo.
David Manford Welling	Petoskey
Thomas Hall Westlake	Cleveland, O.
Renville Wheat, <i>a</i>	Ann Arbor
Walter Franklin Whitman	Grand Rapids
Roman Casimir Widmann	Johnstown, Pa.
Jacob Christian Wiedrich, A.B., <i>College of Emporia</i>	Emporia, Kans.
†Horace Ewing Wilgus, <i>a</i>	Ann Arbor
James Herbert Wilkins, Jr., <i>a</i>	Denver Colo.
Charles McVeigh Willits	Philadelphia, Pa.
Emerson Clyde Woolf, Ph.B., <i>Mount Union College</i>	Alliance, O.
Floyd Leslie Young, <i>a</i>	LaPorte, Ind.
Paul William Zerwekh	Alton, Ill.
Clarence Barco Zewadski, <i>a</i>	Ocala, Fla.

SPECIAL STUDENTS

Julia McGehee Alexander	Charlotte, N. C.
Arden Ellsworth Bing	Elkins, W. Va.
George Sen Oo Chen	Kin-Wha-Fu, China
Joseph Howard Collier	Ann Arbor
Prince Leroy Edwoods	Bay City
Sumner George	Camden, S. C.
Roman Frank Glocheski	Grand Rapids
Frank Joseph Jones	Joliet, Ill.
Bartel John Jonkman	Ann Arbor
Guillermo Manuel Katigbak, B.A., <i>University of the Philippines;</i> <i>L.B., ibid</i>	Lipa, Batangas, P. I.
Robert Lee	Middlebury, Ind.
Irvine Gilbert Levy	Detroit
Harry Abram McCain	Ann Arbor
Shamus O'Brian McFadden, B.S., <i>Oregon Agricultural College</i>	Corvallis, Ore.
Lawrence Nebel	Gladstone
Charles Onesime Oliver	Hancock
Henry Arnold Peterson	Sioux City, Ia.
Clarence Adrian Robertson	Moab, Utah
John Francis Shea	Calumet
Arthur Ray Sherck	Grand Rapids
Rufus Sistler	Golconda, Ill.
John Elmer Staley	Joliet, Ill.
Charles Matthew Van Benschoten	Perry
David Emerson Williams, LL.B.	Virden, Ill.

The students named below, enrolled in the Department of Literature, Science, and the Arts, also pursue studies in the Department of Law, though not registered in the combined course:

Wayne Ives Atwater
 Julius Loeser Berns
 Stanley John Borucki
 Daniel Reuben Brenton
 Lea Valorus Bybee
 Charles Brooks Cleary
 George Harwood Earle
 Fred Sylvester Flick
 Harry Hanson Frank, Jr.
 Harvey LeRoy Frost
 Elmer Hiram Groefsema
 Gilbert Vernet Handy
 Rudolph Joseph Hofman
 Arthur William Kohler
 Frank Frederick Kolbe
 Chester Henry Lang
 George Edward Laska
 Julius Joseph Lechner
 Jacob Levin
 John Harold Lister
 James Stuart Martin
 Ronald Russell Monroe
 Roy Kenneth Roadruck
 Arthur Edward Schneider
 Norman Louis Smith
 Warren Whittier Spangler
 Harold Gladstone Tait
 Joseph Scott Thornton
 Ray Gilbert Vicary
 Zeno Charles Wilkinson
 Claud Stanley Wood
 Joseph Neel Yarnell

Shelby
Cottage Grove
Manistee
Salem, Mo.
Mentone, Ind.
Ypsilanti
Valparaiso, Ind.
Hazleton, Pa.
Phelps, Wis.
Detroit
Mountain Home, Idaho
Bay City
Cheyenne, Wyo.
Lansing
Ann Arbor
Erie, Pa.
Toledo, O.
Detroit
Chicago, Ill.
Buchanan
Shenandoah, Ia.
Leon, Ia.
Morocco, Ind.
Ironwood
Mount Vernon, Ind.
Lebanon, Pa.
Toledo, O.
Erie, Pa.
Saginaw
Hawarden, Ia.
Klamath Falls, Ore.
Bowen, Ill.

The student named below, enrolled in the Graduate Department, also pursued studies in the Department of Law.

Hessel Edward Yntema

Holland

School of Pharmacy

FACULTY

HARRY B. HUTCHINS, LL.D., *President*
EDWARD D. CAMPBELL, B.S.
MOSES GOMBERG, Sc.D.
S. LAWRENCE BIGELOW, Ph.D.
JULIUS O. SCHLOTTERBECK, Ph.C., Ph.D., *Dean*
ALVISO B. STEVENS, Ph.C., Ph.D., *Acting Dean*
DAVID M. LICHTY, Ph.D.
WILLIAM J. HALE, Ph.D.
LEE H. CONE, Ph.D.
HOBART H. WILLARD, Ph.D.
SAMUEL C. LIND, Ph.D.
ROBERT J. CARNEY, A.B.
HARRY N. COLE, A.B., B.S.
WINFIELD S. HUBBARD, Ph.D., *Acting Secretary*
JAMES E. HARRIS, Ph.D.
ROY K. McALPINE, A.B.
JOSEPH S. LAIRD, Ph.D.

Other Instructors and Assistants

ALFRED L. FERGUSON, A.M.
LAWRENCE C. JOHNSON, B.S.
LUCIEN H. GREATHOUSE, A.B., B.Ch.E.
CLIFFORD C. GLOVER, Ph.C.
CARL D. HOCKER, A.B.
EARL C. SHERRARD, Ph.C.
WILLIAM R. WEBB, B.Ped.
WILLIAM P. WOOD, A.B.
WILLIAM V. HOYT, A.B.
GORDON A. BERGV, Ph.C.
L. COLEMAN IUDLUM, B.S.
ROBERT E. MORSE, Ph.C.

STUDENTS*

Lloyd Laverne Andrus	Ph.G.		<i>Tiffin, O.</i>
Charles LeRoy Anspach	Ph.G.		<i>Fremont, O.</i>
Richard Gordon Arner	B.S.	31	<i>Rimersburg, Pa.</i>
†Samuel Aersohn, a	B.S.		<i>Bay City</i>
LaForrest D. Bailey	Ph.G.		<i>Morenci</i>
Gordon Alger Bergy, Ph.C.	B.S.	74	<i>Caledonia</i>
José Maria Blanco	S.		<i>San Juan, P. R.</i>
William John Bonisteel	B.S.		<i>Port Huron</i>
Frederick Thomas Bradt, B.S., Kalamazoo College	B.S.	101	<i>Kalamazoo</i>
William Ralph Breitfeld	B.S.		<i>Geneva, N. Y.</i>
Osborn Allen Brines	B.S.	34	<i>Algonac</i>
Robert George Brown	B.S.		<i>Pigeon</i>
Roland Conn Brown	Ph.G.		<i>Saint Johns</i>
Edwin Julius Busjahn	B.S.	48	<i>Logansport, Ind.</i>
Frank Francis Carson	S.		<i>Ann Arbor</i>
William Frank Casey	Ph.C.	26	<i>Wallingford, Conn.</i>
†Horace James Caulkins, a	B.S.	22	<i>Detroit</i>
William Duscharme Cochran	B.S.	35	<i>Houghton</i>
Charles Costa	B.S.	30	<i>Vulcan</i>
Edwin Walter Crysler	B.S.	30	<i>Littleton, Colo.</i>
Earl Wesley Cummings	B.S.		<i>Detroit</i>
Edward George Curtiss	Ph.C.	68	<i>Kent, O.</i>
Donald Benjamin Darling	S.		<i>Ann Arbor</i>
Frederick Ernest DeVoist	Ph.C.	33	<i>Ann Arbor</i>
**Charles Allen Dillon	Ph.C.		<i>East Tawas</i>
Harry McIntosh Duncan, Ph.C.	B.S.	74	<i>Churchville, N. Y.</i>
William Ewart Feek	Ph.G.		<i>Brushion, N. Y.</i>
Carl Phillips Field	B.S.	61	<i>Grand Rapids</i>
George Karl Finzel	Ph.G.		<i>Monroe</i>
William Robert Fulton	S.	18	<i>Detroit</i>
Edward Dalzell Gibson	Ph.C.	54	<i>Buenos Aires, Argentina</i>
Charles Dennison Gilbert	B.S.		<i>Algonac</i>

* The abbreviations in the column headed Degree indicate the degree for which the student is studying. Where instead the letter S is given, the student is pursuing miscellaneous studies without being registered as a candidate for a degree. The figures in the column headed Credit indicate the number of hours of work taken prior to the beginning of the current academic year, 1913-1914, and completed without conditions, or credited on advanced standing. By an hour of work is meant the equivalent of one exercise a week for one semester. A dagger (†) preceding a student's name signifies that he has pursued studies, for the whole or a part of the year, in another Department of the University, indicated by an italic letter following the name, to-wit: a, Department of Literature, Science, and the Arts; e, Department of Engineering; ea, Department of Architecture; m, Department of Medicine and Surgery; l, Department of Law; h, Homoeopathic Medical College; d, College of Dental Surgery.

** Died November 9, 1913.

Ambrosio Aurelio Grillo	Ph.C.	37	Santiago, Cuba
John Frank Gutmann	B.S.		Monroe
Arthur Joseph Halgren	Ph.C.	30	Escanaba
John James Hardenburg	B.S.		Brocton, N. Y.
Milton Jenks Harnist, Ph.B., of Pharmacy, Ph.C.	St. Louis College B.S.	82	Edwardsville, Ill.
Rodney Beecher Harvey, Ph.C., Purdue University	B.S.	60	Indianapolis, Ind.
Antonio Lee Haskell	Ph.C.	13	St. Louis, Mo.
Armin H. Hauenstein	B.S.	99	Bluffton, O.
Gilbert James Hayes	B.S.	21	Houghton
Ray Joseph Heagany	B.S.		Saginaw
Harry Richard Hearn	Ph.C.	31	Wayne
Luis Gonzaga Hernandez	Ph.C.		Santurce, P. R.
Lawrence Clayton Heustis	Ph.C.		Colorado Springs, Colo.
James William Higgins	Ph.C.	6	Marietta, O.
Albert Miller Hubbard	S.		Ann Arbor
James Leo Hunter	B.S.	57	Williamsport, Ind.
William Tren Isbell	B.S.	62	Saline
Curtis Finerald Jenkins	Ph.C.	33	Detroit
Charles Avery Johnson, A.B., Lincoln University	Ph.C.	26	Columbia, S. C.
Max Wellington Johnson	Ph.C.	14	Indiana, Pa.
Fred George Kiburtz	Ph.G.		Monroe
Thomas Clifford Kier	B.S.	22	Blairsville, Pa.
Frederick Jacob Kopp, Ph.G., Detroit Technical Institute	B.S.		Detroit
Walter George Korn	Ph.C.		Glenwood Springs, Colo.
William Fred Kunke	B.S.	69	Union, Ill.
Neal Bryan Lawrence	B.S.	126	Red Oak, Ia.
Charles Curtis Lempke	Ph.C.		Algonac
Josiah Kirby Lilly, Jr.	Ph.C.	33	Indianapolis, Ind.
Robert Murray McGregor	Ph.C.	25	Hammond, N. Y.
Vance Frederick McIntyre	Ph.C.	34	Mason
Mark Salisbury McKinstry	B.S.	43	Kalamazoo
Cecil R. McMillen	B.S.		McCook, Nebr.
Ellison Gardner MacWhorter	B.S.	48	Millport, N. Y.
Herschel Brian McWilliams	B.S.		Plainville, Ind.
Clyde Alton Madden	B.S.	70	Grand Rapids
Lemuel Edward Martin, Ph.G., Philadelphia College of Pharmacy	Ph.C.	59	Sheridan, Wyo.
Oscar Albert Marton	S.		Bloomington, Ill.
John Frederick Maulbetsch	B.S.		Ann Arbor
†Harold Fildew Millman, e	B.S.	29	Saint Johns
Joseph Isadore Millner	B.S.		Detroit
William Lloyd Mitchell, Ph.C.	B.S.	107	Elk Rapids
Robert Edgar Morse, Ph.C.	B.S.	74	Pigeon
†Henry Nicholas Oellrich, e	B.S.	33	Narrowsburg, N. Y.

Edgar T. Olson	S			<i>Ann Arbor</i>
John Lynn Osborn, Ph.C.,	<i>University of Kansas</i>			B.S.
Leonard Vincent Pearson	B.S.			<i>Baldwin, Kans.</i>
Clarence Alvin Peat	Ph.C.	31		<i>Ann Arbor</i>
Floyd LaVerne Pierce	S			<i>Norwalk, Ohio</i>
Clarence Ernest Pitkin	Ph.G.	25		<i>Ypsilanti</i>
Harold John Polson	B.S.			<i>Whitehall</i>
Frank Edward Prentice	B.S.	65		<i>Saginaw</i>
Claud Greenlee Reed	Ph.G.			<i>Ashtabula, O.</i>
†William Samuel Reveno, e	B.S.			<i>Paris, Ill.</i>
DeLos Pringle Rice	S	21		<i>Detroit</i>
Earl Virgil Rice	B.S.	97		<i>Ann Arbor</i>
Andrew Edward Roedel	B.S.	28		<i>Oberlin, O.</i>
†Maurice Lane Rushmore, e	B.S.	21		<i>Cheyenne, Wyo.</i>
Samuel Spencer Scott	Ph.C.	80		<i>Old Mission</i>
William Louis Seibert	B.S.	28		<i>Cranford, N. J.</i>
Ralph Bolter Shivel	B.S.	67		<i>Bolivar, N. Y.</i>
Robert Frederick Smith	Ph.C.	33		<i>Constantine</i>
Stanley Alton Snyder	Ph.G.			<i>Swanton, O.</i>
John Charles Stapleton	B.S.			<i>Grand Rapids</i>
Henson Hoff Thomas, B.S.	B.S.			<i>Ashtabula, O.</i>
Mervin Wilfred Tomlin	B.S.			<i>Ann Arbor</i>
William Harold Upjohn	B.S.	110		<i>Port Huron</i>
Abram VanLoo	Ph.C.			<i>Kalamazoo</i>
George Sydney Vedder	Ph.G.			<i>Zeeland</i>
Seth William Watson	Ph.C.			<i>LaHarpe, Ill.</i>
Howard Earsom Weaver	Ph.C.			<i>Grand Rapids</i>
Harold Ralph Wells	B.S.	60		<i>Greenville, O.</i>
Charles Homer Whisler	Ph.C.	43		<i>Wellsville, N. Y.</i>
Howard Wesley Wickett	B.S.			<i>Leipsic, O.</i>
Emmert Henry Woodhouse	Ph.C.	33		<i>Decatur</i>
Merle M. Woodward	B.S.	33		<i>Friendship, N. Y.</i>
				<i>Springville, N. Y.</i>

Homœopathic Medical College

FACULTY

HARRY B. HUTCHINS, LL.D., *President*
VICTOR C. VAUGHAN, M.D., Ph.D., LL.D.
WARREN P. LOMBARD, A.B., M.D.
WILBERT B. HINSDALE, M.S., A.M., M.D., *Dean*
WILLIS A. DEWEY, M.D., *Secretary*
CLAUDIUS B. KINYON, M.D.
DEAN T. SMITH, B.S., M.D.
FREDERICK G. NOVY, M.D., Sc.D.
G. CARL HUBER, M.D.
ALDRED S. WARTHIN, M.D., Ph.D.
DEAN W. MYERS, M.D.
GEORGE L. STREETER, A.M., M.D.
CLAUDE A. BURRETT, Ph.D., M.D., *Registrar*
HARRY N. COLE, A.B., B.S.
RALPH R. MELLON, B.S., M.D.

Assistants

GEORGE I. NAYLOR, A.B., M.D.
FLOYD F. FELLOWS, A.B., M.D.
HARRY M. SAGE, M.D.
BURTON J. SANFORD, M.D.

Non-Resident Lecturer

OSCAR B. LONG, M.D.

STUDENTS*

RESIDENT PRACTITIONER

Arthur Julius Sahs, M.D.

Pointe Aux Pins

Detroit Homœopathic Medical College

* A dagger (†) preceding a student's name signifies that he has pursued studies, for the year or a part of the year, in another Department of the University, indicated by an italic letter following the name, to-wit: a, Department of Literature, Science, and the Arts; e, Department of Engineering; ea, Department of Architecture; m, Department of Medicine and Surgery; l, Department of Law; p, School of Pharmacy; d, College of Dental Surgery. The letter (without the dagger) indicates that the student is pursuing a combined course, leading to a degree in each of the two Departments.

FOURTH YEAR STUDENTS

Guy Garland Alway
 Harold Gerney Bostick
 Paul Morrow Champlin
 Bessie Ione Coffin
 Milton Alfred Darling, D.D.S.
 George Benjamin Faulder
 Rollin Van Nostrand Hadley
 David Benjamin Hagerman
 Wellington Baker Huntley
 Robert Scott Ideson
 Frank Remington Loomis
 Ira Dean McCoy
 John Frank Migdalski
 Walter Wayland Oliver
 Edward John Phillips
 Orlando William Pickard
 Curtis Dudley Pillsbury
 Fred Romer Reed
 Martin Robinson
 Charles Theodore Root
 William Denton Rowland
 George Gains Shoemaker
 Norman Smith Starr
 Neville Edward Stewart
 Charles Daniel Toole

Ann Arbor
Benton Harbor
Detroit
Addison
Ann Arbor
Sidney, O.
Olean, N. Y.
Wauseon, O.
Ann Arbor
Avon, N. Y.
Brooklyn
Emminton, Pa.
Cleveland, O.
Camden
Wilkes Barre, Pa.
Sandwich, Ont.
Minneapolis, Minn.
Ann Arbor
Detroit
Detroit
Hagerstown, Md.
North Manchester, Ind.
Charleston, Ill.
Wauseon, O.
Geneseo, N. Y.

THIRD YEAR STUDENTS

Jesse William Allen
 Van Dale Barnes
 John Ferguson Blinn, M.S., *New Mexico College of Agriculture
 and Mechanical Arts*
 Lloyd Ralph Clay
 James J. Conlon
 Robert Harold Criswell
 Edwin Carl Ganzhorn
 Harry H. Hammel
 Hugh Rannells Hildebrandt
 Howard Morton Holcombe
 Donald Burr Marsh
 Colin Campbell Owen
 Edith Ella Peltier
 Frederick Pietz
 Frank Freeman Pray
 Cortlandt Whitehead Schepeler
 Gladys Irene Torrey
 Floyd Raymond Town

Kingsville, O.
Morenci
Loveland, O.
Angola, Ind.
New Cumberland, W. Va.
Quincy, Ill.
Ann Arbor
Ann Arbor
Washington Court House, O.
Chateaugay, N. Y.
Galion, O.
Detroit
Thompsonville
Saginaw
Ionia
Ann Arbor
Leslie
Jackson

SECOND YEAR STUDENTS

Henry Clement Allen, A.B.	Independence, Ia.
Daniel Marvin Clarke	Scranton, Pa.
Philip Eggleston Haynes, A.B., <i>Bethel College</i>	Howell, Ky.
Bessie Naomi Newcomb	Carleton
Walter Wilton Read	Halifax, Nova Scotia
Anthony Maryan Sawicki	Schenectady, N. Y.
Norman Dudley Shaw	Utica, N. Y.
George Jeremiah Smith	Ann Arbor
Ralph Stanley Stauffer, <i>a</i>	Hagerstown, Md.
Camp Chandler Thomas, B.S., <i>Kalamazoo College</i>	Grand Rapids
Eugene Sharp Thornton, A.B., <i>Wabash College</i>	Lebanon, Ind.
Willy Karl Rudolf Voigt, E. Min.	Charlottenbrunn, Germany
<i>University of Freiburg, B.S., ibid</i>	

FIRST YEAR STUDENTS

Geno Ethel Beery, A.B., <i>Manchester College</i>	Covington, O.
Victor William Bergstrom	Bay City
Stuart Broadwell, Jr.	Springfield, Ill.
Fred J. Cady	Mason
Harold Francis Closz, B.S., <i>Central College</i>	Webster City, Ia.
Chester Allen Crosby	Weir, Kans.
Dwight Goddard Estabrook	Dayton, O.
Ammi Lloyd Johnson, <i>a</i>	San Bernardino, Cal.
Jans Andreas William Johnson	Castana, Ia.
Edward Helling Kennedy	Albion, N. Y.
Seligman Hyers Lewinstein	Midland
Charles Maggio	Rochester, N. Y.
Clifford Bagley Mandeville	Barilesville, Okla.
Edward McKee Mead	Ann Arbor
Hugh John Strathearn	Jackson
Bernhard Henry Vollertsen	Rochester, N. Y.
Harold Edward Wisner	Ann Arbor
Charles Clements Wolcott, B.S., <i>Kansas State Agricultural College</i>	Garfield, Kans.

UNCLASSIFIED

Henry J. Burrell	Ann Arbor
James Chester Danforth	Berlin
Sadie Louise Omev	Detroit
Philip Preston Serio	Ann Arbor

College of Dental Surgery

FACULTY

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S. LAWRENCE BIGELOW, Ph.D.
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CYRENUS G. DARLING, M.D.
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ELMER L. WHITMAN, D.D.S.
FRANK C. COLE, D.D.S.
ALFRED J. SCHROEDER, D.D.S.
HERBERT S. BAILEY, D.D.S.
CHALMERS J. LYONS, D.D.S.

Demonstrators and Assistants

HARRY L. BLACK, D.D.S.
CHARLES W. FARGO, D.D.S.
CORTEZ R. HALL, D.D.S.
ALBERT J. HALL, D.D.S.

Special Lecturers

MILTON T. WATSON, D.D.S.
HERBERT H. HARPER, D.D.S.

STUDENTS*

THIRD YEAR STUDENTS

Harold Arthur Badger	<i>Ticonderoga, N. Y.</i>
Leo Eugene Baribeau	<i>Grand Ledge</i>
Frank Benham	<i>Van Buren Township, Ind.</i>
Levon Garabed Beshgetoor, A.B., <i>International College</i>	<i>Smyrna, Turkey</i>
David James Bort	<i>Bay City</i>
Charles Harold Brady	<i>Edwardsburg</i>
Don Clifford Broadbridge	<i>Marine City</i>
James Alphonsus Calby	<i>Montrose, Pa.</i>
Bernice Elon Champe	<i>Logansport, Ind.</i>
Frederick Charles Daniels	<i>Waterbury, Conn.</i>
Minnie Louise Davis	<i>Prescott, Ariz.</i>
Abram Frank De Heer	<i>Grand Haven</i>
Ralph Philip Dendel	<i>Wayne</i>
Albert Henry Dredge	<i>Detroit</i>
John Drozkowski, Jr.	<i>Ironwood</i>
Aaron Fouts Eidemiller	<i>West Milton, O.</i>
Albert Walter Farley	<i>Almont</i>
Rufus Chester Field	<i>Grand Rapids</i>
Richard Maxwell Fullerton	<i>Ann Arbor</i>
Edward John Green	<i>Syracuse, N. Y.</i>
James Mayhew Gregory	<i>Kingston, Jamaica, W. I.</i>
Warren Elias Guerrier	<i>White Pigeon</i>
Edwin Slone Hanna	<i>Ann Arbor</i>
Earl Vere Harrington	<i>Leadville, Colo.</i>
Hertha Charlotte Hartwig	<i>Detroit</i>
Paul Campbell Hohl	<i>Lima, O.</i>
Foster McLane Holmes	<i>Vicksburg</i>
Fletcher Rockwell Jackson, Ph.B., <i>Kenyon College</i>	<i>Ann Arbor</i>
Timothy Parnell Jamison	<i>Mount Pleasant</i>
Breyton Delos Jones	<i>Ann Arbor</i>
Clifford McCormick Jones	<i>Manistee</i>
Florenz Alphonso Klopfer	<i>Black Diamond, Wash.</i>
Norbert Daniel Kulasavicz	<i>Bessemer</i>
Ralph Emerson Lambert	<i>West Milton, O.</i>
Perry Jay Lockwood	<i>Oxford</i>
Rollo Lowm	<i>Pulaski</i>

* A dagger (†) preceding a student's name signifies that he has pursued studies, for the year or a part of the year, in another Department of the University, indicated by an italic letter following the name, to-wit: a, Department of Literature, Science, and the Arts; e, Department of Engineering; ea, Department of Architecture; m, Department of Medicine and Surgery; l, Department of Law; p, School of Pharmacy; h, Homoeopathic Medical College. The letter (without the dagger) indicates that the student is pursuing a combined course, leading to a degree in each of the two Departments.

Frank Paquette McCarthy	<i>Schenectady, N. Y.</i>
Clarence Pearce MacDonald	<i>Loomis</i>
Kenneth Duncan McKenzie	<i>Toronto, Ont.</i>
Oscar Manthey	<i>Berlin, Germany</i>
Charles Veits Manville	<i>Burke, S. Dak.</i>
Paul Edward Meyer, Ph.C., <i>University of California</i>	<i>Sacramento, Cal.</i>
Roderick Cleveland Morrison	<i>Hancock</i>
Joseph Allen Motley	<i>Ann Arbor</i>
Frank James Mulcahy	<i>Chesaning</i>
Floyd Elmer Nichols	<i>Medina, O.</i>
Robert Nowack	<i>Menominee</i>
Albin Nyquist	<i>Gwinn</i>
Patrick Henry O'Leary	<i>Chateaugay, N. Y.</i>
Charles Levi Pickell	<i>Big Rapids</i>
Harold Pilgrim	<i>London, England</i>
Ernest Leon Pilkinton	<i>Portland</i>
Lewis Emery Read	<i>Ithaca</i>
Charles Ainsley Rice	<i>Williamston</i>
Milburn Egbert Rice	<i>Williamston</i>
Don Frederick Roedel	<i>Chelsea</i>
Elbert Calvert Ryle	<i>Wyandotte</i>
Ewonda Bernhardina Schlencker	<i>Amsterdam, Holland</i>
Court Carl Schwartzbek	<i>Bryan, O.</i>
John Adams Scofield	<i>Scottsville, N. Y.</i>
Raphael Marcar Serijanian, A.B., <i>Anatolia College</i>	<i>Ordon, Turkey, Asia Minor</i>
John Griffith Shaffer	<i>Altoona, Pa.</i>
Marion Melvin Sheaffer	<i>Howe, Ind.</i>
Cecil Millard Sigler	<i>Pinckney</i>
Ernest Richard Smith	<i>De Graff, O.</i>
Harry Eben Sooy	<i>Wayland</i>
Burr Edwin Stevens	<i>Defiance, O.</i>
Henry Peter Struik	<i>Ellsworth</i>
John Robert Teifer	<i>Trenton</i>
Wallace J. Tripp	<i>Bad Axe</i>
Clarence Nicholas Vin	<i>Grand Haven</i>
Clair Underwood Walker	<i>Fredonia, N. Y.</i>
Horton Rogers Warren	<i>Grand Rapids</i>
Benjamin Dennis Welling	<i>Big Rapids</i>
Loy Albion Weston	<i>Port Huron</i>
Gordon Edward Wittet	<i>Detroit</i>

SECOND YEAR STUDENTS

Albertus Hiebner Ackerman	<i>Wakkerstroom, South Africa</i>
Lawrence Ernest Aldrich	<i>Albion</i>
Joseph Robert Applegate	<i>Ann Arbor</i>
Wilber Edwin Bailey	<i>Ann Arbor</i>
Garnet Douglas Beierl	<i>Markham, Ont.</i>

Lloyd Bond	Harbor Springs
Arnold Bosscher	Pretoria, South Africa
Charles Philip Bower	Flushing
George Jacob Broodman	Grand Rapids
Carroll Stuart Brown	Ilion, N. Y.
Robert Brown	Carsonville
James B. Caldwell	Sandusky
John Alexander Campbell	Hancock
Carlton Fritz Cantor	Erie, Pa.
Willem Hugo Cilliers	Stellenbosch, South Africa
Howard Isaac Clark	Wyandotte
Walter Charles Collins	Butte, Mont.
Claude Lionel Cross	Muskegon
William Walter Davis	Muskegon
Marion Cornelius Dekker	Zeeland
Howard Ralph Dingle	Lansing
Robert Louis Donaldson	Bellevue, O.
Marion Llewellynn Drake	Marquette
Edward Alexander Dratz	Muskegon
Charles Doig Dunlop	Tubicorin, South India
Seymour LeGrande Elliott	Marshall, Minn.
Ralph Fanning Enstine	Southampton, N. Y.
Reginald Lawrence Felton	Valparaiso, Ind.
Roy Wells Fonda	Geneva, N. Y.
Bernard Basil Foster	Ann Arbor
Edward Clare Freeland	Saint Thomas, Ont.
William Ignatius French	Detroit
Clifton George Frye	Oak Harbor, O.
John Nesbit Gallagher	Clarks Mills, Pa.
Veder Donald Gardner	Randolph, N. Y.
LeRoy Frederick Garrison	Syracuse, N. Y.
Garland Garl Gee	Constantine
Warren Potter Gibson	Brent Creek
Clinton Stephen Hafford	Albion
Robert E. Haskett	West Milton, O.
Harold David Henderson	Mason
William Hannan Hubbard	Pontiac
Arthur Collins James	Lancaster, N. Y.
William Stuart James	Cape Town, South Africa
John Gwyn Jones	Utica, N. Y.
Lyman Lawrence Jones	Wyandotte
Neil Freeman Jones	Wayne
Alfred William Kany	Dolgeville, N. Y.
John Albert Kimmel	Elk Point, S. Dak.
Henry Marvin Klein	Syracuse, N. Y.
Andrew Kühn	Winburg, South Africa
Forrest Hart Kurtz	Clayton
Burr Wilson Lathrop	Hillsdale
Lyle Curtis Ling	Fowlerville

Roger Sheaffe Loring
 Stanley Carl Lucas
 Wesley McConlogue
 Frank Wallace McDonald
 James MacKeown MacVicar
 Harold Richard Mead
 William Clarence Melvin
 William Will Mitchell
 Clarence Morgan Mote
 Clarence Henry Moyer
 Cecil Ray Mull
 Raymond Edward Nichols
 Ardashes Jivelegyan Nishon
 Leo John O'Brien
 Earl Compton Peabody
 Herbert Fredrick Pedler
 John Hershell Penhale
 Leo Herbert Raupp
 Eber Jones Reynolds
 Harold Edgar Rice
 Bertsel Donald Roe
 Harold David Rose
 Clarence William Schroeder
 Lawrence August Sherry
 John Clinton Shoemaker
 Harold Silverstein
 Einar William Sivula
 Walter Aloysius Slazinski
 Roy Earl Smith
 William Emerson Smith
 Alfred LaVern Souter
 Stephen Douglass Sparks, A.B.
 Delmer Edward DeForest Standish
 Unico Stiemens
 Harry Charles Striffler
 Gerald Dorris Strong
 Harold Jay Thorne
 Frederick Richard Charles Thowld
 Lynn Harold Tingay
 Elliel Axel Waara
 William Herbert Waller
 Ralph McKinley Waltz
 Leo James Witmire

Dallas Center, Ia.
Saint Thomas, Ont.
Inkster
Granville, N. Y.
Inwood, Ont.
Schenectady, N. Y.
Ann Arbor
Charlevoix
Beaverton
Grand Ledge
Vermontville
Carey, O.
Detroit
Grand Rapids
Mulliken
Muskegon Heights
Saint Thomas, Ont.
Ecorse
Xenia, O.
Yale
Bowling Green, O.
Decatur
New Bremen, O.
Defiance, O.
North Manchester, Ind.
Boyne City
Ishpeming
Bay City
Hudson
Bremerton, Wash.
Shelby
Stevensville, Va.
Ann Arbor
Pretoria, South Africa
Cass City
Homer
Battle Creek
Saint Louis
Albion
Hancock
Clare
Durand
Ypsilanti

FIRST YEAR STUDENTS

Harold Augustus Arnold
 Robert Earl Baker
 John Hughes Barringer
 Larry D. Bartlett

Mount Clemens
Detroit
Huntington, W. Va.
Mount Vernon, O.

Arthur John Bolt	<i>Grand Haven</i>
George Chester Booth, a	<i>Indianapolis, Ind.</i>
Lester Hughes Bouquin	<i>Fredonia, N. Y.</i>
George Charles Bowles, Jr.	<i>Detroit</i>
Paul Leon Brockman	<i>Romeo</i>
Scevillian C. Broomfield	<i>Millbrook</i>
Leon David Bryant	<i>Susquehanna, Pa.</i>
John William Bunker	<i>Eaton Rapids</i>
Horace Butterfield Burr	<i>Goshen, Ind.</i>
George Elisha Chichester	<i>Great Falls, Mont.</i>
Charles Douglas Cole	<i>Maple Rapids</i>
Clarence Francis Coleman	<i>Union City, Ind.</i>
Edward Allen Collacott	<i>Ann Arbor</i>
Dana John Cote	<i>Iron Mountain</i>
Lee Daniel Craig	<i>Janesville, Wis.</i>
George Harold Crusius	<i>Paulding, O.</i>
Roscoe Davis Cummins	<i>Hillsdale</i>
Wilfred Adams Davids	<i>Detroit</i>
James Arthur Dean	<i>Benton Harbor</i>
Leon John Deger	<i>Dayton, O.</i>
Jacob deLiefde	<i>Grand Rapids</i>
Will Ezekiel Dennis	<i>Oxford</i>
Ferdinand Gottlob Dratz	<i>Muskegon</i>
Henry Doig Dunlop	<i>Tuticorin, South India</i>
Chester Davis Dursema	<i>Grand Haven</i>
Mohamed El-Sayed	<i>Alexandria, Egypt</i>
Newton Emmons Erwin	<i>Greensburg, Pa.</i>
Leonard Palmer Fisher	<i>Ann Arbor</i>
George Albert Frederick	<i>Owosso</i>
James Augustine Gaffney	<i>Rochester, N. Y.</i>
Leo Max Globensky	<i>Hillsdale</i>
Hilliard William Goldstick	<i>Detroit</i>
Bruno Lessing Grajewski	<i>Pittsburg, Pa.</i>
Davenport Jackson Grimes, A.B., <i>Atlanta University</i>	<i>Atlanta, Ga.</i>
Clifford Peter Haas	<i>Sioux Falls, S. Dak.</i>
Harold George Haas	<i>Leesburg, O.</i>
Arthur Hallam Hadley	<i>Holly</i>
†Carl G. Handshaw, a	<i>Mendon</i>
Harold Gray Hanna	<i>Hewuvelton, N. Y.</i>
Joseph Ray Hawn	<i>Buffalo, N. Y.</i>
Clinton Vere Hibbler	<i>Detroit</i>
Raymond Lee Hooper	<i>Canton, O.</i>
Howard Hamilton Jackson	<i>Ann Arbor</i>
Frank John Kane	<i>Dunkirk, N. Y.</i>
Ricardo M. Kellogg	<i>Battle Creek</i>
Ernest Fredrick Kilchenman	<i>Northport</i>
William B. Klinesteker	<i>Byron Center</i>
Prodromus Marco Kyprianides	<i>Detroit</i>
Leslie John Lambert	<i>Springfield, Ill.</i>

Creighton Lynford Lane	Albion
Harold Milton Lechner	Dunkirk, N. Y.
Frank Nicholas Leicht	Rochester, N. Y.
Oliver Otto Leininger	Wauseon, O.
Alfred Harold Lowther	Detroit
Andrew James McClellan, Jr.	Detroit
Francis James McDonald	Saginaw
Luvois Andrew McEwen	Athena, Ore.
Matthew E. McKenna	Carson City
Stanley Alexander Mackenzie	Detroit
Gerald Ebenezer Madison	Herkimer, N. Y.
Charles Harold Matson	Fenton
William Kendall Meade	Orleans
Orland Alfred Miller	Detroit
Albion O'Neill Mitchell	Wilberforce, O.
Harry James Mogford	Flint
Roy Edward Moran	Pinckney
Ben J. Moss	Maple Rapids
Robert Emmett Motley	Ann Arbor
Thomas Harold Mulchay	Coudersport, Pa.
Raymond John Mullen	Ironwood
Russell Lee Newling	Unley, South Australia
Harry Ellis Osborn	Charlotte
Fred Charles Peters	Bay City
Robert Emmett Price	Foxburg, Pa.
Robert Walter Priest	Johannesburg, South Africa
Harold Joseph Quigley	Rochester, N. Y.
Clifton M. Rice	Williamston
William Grover Rich	Gaylord
Albert James Richards	Detroit
Charles Harold Richardson	Owosso
Ura Garfield Rickert, B.S., <i>Buchtel College, M.S.</i>	Ann Arbor
John Ebenezer Robertson	Bloemfontein, South Africa
William Robertson	Bloemfontein, South Africa
Arthur Dudley Robinson	Wayne
James Kane Robinson	Muskegon
Ernest Allen Ross	Hanover
Wayne N. Roulette	Frankfort, N. Y.
Hilding Ellwood Schedine	Woonsocket, R. I.
Charles Israel Schlissel	Detroit
Ralph Stacy Segware	Hopkinton, N. Y.
Adriaan vanWyk Serfontein	Boshof, South Africa
Leopold Siev	Bronx, N. Y.
Robert Fitch Smith	Fremont, O.
Anthony Fred Sommer	Detroit
Walter Louis Spencer	Grand Rapids
Archie Ward Squiers	Burton
Leighton Goldsmith Steele	Butler, Pa.

†Lyman Bruce Stewart, A.B., *g**Olivet College*

Fillmore Ward Stolpe

Floyd Peter Sugnet

Bernard Vexler

Theodore Bernhardt Voog

Herbert Wagner Weisel

Robert Jennings Wells

Herbert Roy Wilson, A.B.

Harry Traver Wood

Carleton W. Woods

Clarence John Wright

Frank Adolph Zastrow

*Chesaning**Marquette**Midland**Brooklyn, N. Y.**Eagle Grove, Ia.**Fairbury, Nebr.**Buchanan**Springfield, Mass.**Detroit**Ann Arbor**Cassopolis**Lapeer*

Graduate Department

FACULTY

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KARL E. GUTHE, Ph.D., *Dean*.

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FRED N. SCOTT, Ph.D.
HENRY M. BATES, Ph.B., LL.B.
ALEXANDER ZIWET, C.E.
JESSE S. REEVES, Ph.D.

STUDENTS*

Robert Walker Adkisson, A.B., <i>Central College</i>	<i>Fayette, Mo.</i>
Classical Philology.	
Hazel Dodge Albano, u	<i>Chesaning</i>
Rhetoric.	
Alida Alexander, B.S., <i>Michigan Agricultural College; A.M., s</i>	<i>Devil's Lake</i>
Botany.	
Archibald Merrill Allison, A.B., <i>Bucknell University, ss, sp</i>	<i>Chicago, Ill.</i>
Russell Vernon Allman, A.B., <i>Albion College; A.M.</i>	<i>Deckerville</i>
Physics.	
Louis Theodore Anderegg, A.B., <i>Oberlin College, A.M., ibid</i>	
Chemistry.	<i>New Berlin, O.</i>

* The department of specialization selected by candidates for an advanced degree is indicated under their respective names. Students not candidates for a degree are marked sp. Unmarked names indicate students enrolled during the academic session of 1913-1914; those with ss were members of the Summer Session of 1913 only; names marked with s indicate students who were enrolled in both the Summer Session of 1913 and the academic session of 1913-1914; abs shows that the student was permitted to complete some courses in absentia; f shows that the student completed the undergraduate course in February, 1914, but will not take his bachelor's degree until the following commencement in June; u shows that the student is an undergraduate, pursuing studies in the Graduate Department under the rule stated

- Robert Eugene Angell, A.B., *Kalamazoo College*, ss *Kalamazoo*
Chemistry.
- Margaretha Ascher, A. B.; A. M., *University of Chicago*, s *Saginaw*
German.
- John Fleming Atkins, A.B., *Virginia Christian College*
Philosophy. *Keenan, W. Va.*
- Wayne Jason Atwell, A.B., *Nebraska Wesleyan University*
Histology and Embryology. *Lincoln, Neb.*
- Lucy Ella Babcock, Ph.B., *Syracuse University*, ss *LaGrange, Ill.*
Zoology.
- Arthur August Backhaus, B.S., *University of Rochester*
Chemistry. *Madison, S. Dak.*
- Horace Burrington Baker, B.S., ss *Ann Arbor*
Zoology.
- John William Baldwin, A.B., *Lebanon University* *Lebanon, O.*
Mathematics.
- Lena Amelia Barber, B.S., *Adrian College*; A.B., M.S., ss, sp
Columbia Mo.
- A. Lincoln Barker, A.B., *Olivet College*, ss *Marshfield, Ore.*
Sociology.
- Ernest Franklin Barker, B.S., *University of Rochester*; A. M.
Physics. *Rochester, N. Y.*
- Henry Jewell Bassett, A.B., *Maryville College*; A.B., *Princeton*
University; A.M., *Maryville College*, ss *Maryville, Tenn.*
Classical Philology.
- Irving Miles Bassett, A.B., ss *Coldwater*
German.
- William Howard Batson, A.B., *Antioch College*, abs, s
Education. *Fort Worth, Tex.*
- John Watson Beach, A.B.
Classical Philology. *Fargo, N. Dak.*
- George Gerald Bechtel, A.B., *Albion College*; A.M., *ibid*; LL.B.
Detroit College of Law. *Detroit*
Political Economy.
- Howard Hartzler Beltz, B.S., A.M., sp *Akron, O.*
- Suzan Rose Benedict, B.S., *Smith College*; A.M., *Columbia*
University, s *Northampton, Mass.*
Mathematics.
- Sybil Kennedy Bennett, Ph.B., *Syracuse University* *Ann Arbor*
Sociology.
- William Edward Bingham, B.D., *Meadville Theological School*
Philosophy. *Brighton, England*
- Louis Emmett Birdsall, A.B. *Olivet College*, A.M., *ibid*, ss
Education. *Fowlerville*
- Lucy Caroline Bishop, A.B. *Ann Arbor*
Classical Philology.
- Richard Elwood Bissell, B.S., *Michigan Agricultural College*
Mechanical Engineering. *Lansing*

- Sarah Mildred Boland, A.B., *Western College for Women*, ss
Zoology. *Paris, Ill.*
- Cornelius Frederick Bolt, A.B., ss *Grand Haven*
Political Economy.
- John David Bond, A.B., *University of Tennessee*, ss, sp
Gallatin, Tex.
- Juan Antonio Bonilla, A.B., ss *Cali, Colombia, S. A.*
Pathology.
- Orlan William Boston, B.M.E. *Ann Arbor*
Mechanical Engineering.
- Chauncey Samuel Boucher, A.B., A.M. *Ann Arbor*
History.
- Lillian Hendrickson Boulton, A.B., *Vassar College*, ss, sp
Westfield, N. Y.
- Francis Nicholls Bradford, A.B., *Louisiana State University*, ss
Political Science. *Rayne, La.*
- Glenn Danford Bradley, A.B., A.M., s *Ann Arbor*
American History.
- Helen Gertrude Brandebury, u, sp *Huntington, W. Va.*
- Joseph H. Bridges, B.S. *Detroit*
Forestry.
- John Crowe Brier, B.S., M.S. *Jamestown, N. Y.*
Chemical Technology.
- Hugh Brodie, B.S. (C. E.) *Ann Arbor*
Civil Engineering.
- Dorothy Miles Brown, A.B. *East Lansing*
Political Economy.
- Henrietta May Brown, f *Jackson*
Latin.
- Jacob Sylvester Brown, A.B., ss *Creekside, Pa.*
Chemistry.
- Laura Alice Brown, Ph.B., *Alma College* *Alma*
History.
- Leroy Nicholas Brown, u *Clarkston*
Chemical Engineering.
- Robert Ellsworth Brown, A.B., *University of Illinois*, ss, sp
Upland, Ind.
- Charles Howard Bryan, A.B., *Albion College*, ss, sp *Manistee*
- Lyman Lloyd Bryson, A.B. *Ann Arbor*
Rhetoric.
- Zeltah Pauline Buck, A.B. *Vassar*
Psychology.
- John Joseph Burby, f, sp *Ann Arbor*
- Mildred Mary Burns, A.B., s *Monroe*
Education.
- Victor Raymond Burton, B.C.E. *Oak Harbor, O.*
Civil Engineering.

Clara Belle Cady, A.B., <i>Olivet College, ss</i>	<i>Hammond, La.</i>
English.	
Wilbur Pere Calhoun, Ph.B., <i>Hiram College</i>	<i>Hiram, Ohio</i>
Political Economy.	
Annie Cannon Campbell, A.B., <i>Wilson College, ss</i>	
English.	<i>Pennsylvania Furnace, Pa.</i>
Clifton O'Neal Carey, B.S., <i>Wilmington College; B.S., Haver-</i>	
<i>ford College; B.S. (C.E.)</i>	<i>Ann Arbor</i>
Civil Engineering.	
Arthur B. Carr, A.B., <i>Albion College, ss</i>	<i>Springfield, S. Dak.</i>
Physics.	
Theron Eugene Chapel, B.S., <i>Alma College, ss</i>	<i>Parma</i>
Chemistry.	
Alberta Elizabeth Chase, A.B., <i>ss</i>	<i>Elsie</i>
English.	
Lewis Herbert Chrisman, Ph.B., <i>Dickinson College, A.M., ibid,</i>	
<i>ss, sp</i>	<i>Berea, O.</i>
Henry Ward Church, A.B., A.M., <i>abs</i>	<i>Monmouth, Ill.</i>
German.	
Herman Aldrich Clark, A.B., A.M., <i>ss, sp</i>	<i>Crystal Falls</i>
Robert Watson Clark, A.B., A.M.	<i>Ann Arbor</i>
Mineralogy.	
Willis Henry Clark, A.B., <i>s</i>	<i>Detroit</i>
Physics.	
Leroy Melville Coffin, B.S., <i>University of Maine; A.M., s</i>	
Mathematics.	<i>Los Angeles, Cal.</i>
Edward LeRoy Cole, A.B., <i>s</i>	<i>Jackson</i>
Education.	
Willis Huntley Collar, A.B., <i>s</i>	<i>Mason</i>
Chemistry.	
James Blaine Thomas Colman, B.S., (C.E.)	<i>Coldwater</i>
Civil Engineering.	
Nellie Grant Congdon, A.B., <i>ss, sp</i>	<i>Saline</i>
Hope Griswold Conklin, A.B., <i>s</i>	<i>Ann Arbor</i>
Latin.	
Louise Ward Conklin, A.B.	<i>Ann Arbor</i>
Education.	
Thomas Connery, A.B., <i>ss, sp</i>	<i>Saginaw</i>
George Herbert Coons, A.B., <i>University of Illinois; A.M. Uni-</i>	
<i>versity of Nebraska, abs</i>	<i>East Lansing</i>
Botany.	
Leigh Guillot Cooper, A.B., A.M.	<i>Detroit</i>
History.	
William Hawthorne Cooper, A.B., A.M., <i>ss</i>	<i>Naperville, Ill.</i>
English.	
Alice Marie Cornwell, <i>u</i>	<i>Ann Arbor</i>
Romance Languages.	
Irene Marie Cornwell, A.B., A.M., <i>ss, sp</i>	<i>Ann Arbor</i>

Anna Belle Corson, A.B. English.	Birmingham
Amaryliss Marie Cotey, A.B., ss French.	Cadillac
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Summer Session 1913

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Justin Woodward Harding, <i>l</i>	Franklin, O.
Doyce Harry Harned, <i>Teacher, a</i>	Jersey City, O.
Jerry Ignatius Harrington, <i>Teacher, a</i>	Ishpeming
William Alfred Hart	Fredonia, N. Y.
Rutson Maury Hatchett, <i>Teacher</i>	Montgomery, Ala.
Helen Marie Hatten, <i>Student in University of Chicago</i>	Chicago, Ill.
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Merwin Haven, <i>a</i>	Ottumwa, Ia.
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Harry Howick, <i>a</i>	Celina, O.
Pao Hwang Hsii	Kin-kiang, China
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James Roy Hurley, <i>m</i>	Cass City
Ewin R. Hurst	Dowagiac
Walter S. Hutchison, <i>l</i>	Scott, O.
Walter Darst Hyatt	Toledo, O.
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John Samuel Lee	Waymart, Pa.
Yen Chu Lee	Hsinyang City, China
Yii Lee	Hsinyang City, China
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Chi Tsing Lu	Kiangsi, China
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Alice Jean Lynch	Flushing, N. Y.
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Byron Earle Smith, <i>a</i>	Ann Arbor
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Abba Grace Watton, Teacher	Holly
Mae H. Watton, a	Holly
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Catherine Dickson Wenley, a	Ann Arbor
Jermima Veitch Wenley, a	Ann Arbor
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Horace Ewing Wilgus, a	Ann Arbor
Walter Quincy Wilgus	Ann Arbor
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Roy Custer Banks, <i>e</i>	<i>Fenton</i>
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Vandalia
Detroit
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Elmer Warren Miller, <i>e</i>	<i>Grand Junction, Colo.</i>
Harry William Miller, <i>e</i>	<i>Northampton, Mass.</i>
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Leonard Boris Moiseyeff, <i>e</i>	<i>Khabarovsk, Russia</i>
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William Carl Weilbacher, <i>e</i>	<i>Springfield, O.</i>
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Robert Emra Wolf, <i>e</i>	<i>Hillsdale</i>
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Charles Martin Ziegler	<i>Saginaw</i>

DEPARTMENT OF MEDICINE AND SURGERY

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Albertus Hieber Ackerman, <i>d</i>	<i>Transvaal, South Africa</i>
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Nathan Edward Van Stone,	<i>a</i>	<i>Battle Creek</i>
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Loy Albion Weston,	<i>d</i>	<i>Port Huron</i>
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Joseph Earl Brown	<i>Hebron, Ind.</i>
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Carleton Burrier	<i>Minneapolis, Minn.</i>
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Earl Davis	Beaver Falls, Pa.
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Francis Samuel Rosenthal, <i>l</i>	Ann Arbor
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Warwick Inman Rowland, <i>l</i>	Columbus, O.
Mack Ryan, A.B., <i>l</i>	Brimley
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Robert Jay Selzer	Cleveland, O.
Samuel Shapero, <i>a</i>	Bay City
James Thomas Sloan, <i>l</i>	Colorado Springs, Colo.
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John Clarence Stephens, <i>l</i>	Niles, O.
Warren Huntsman Stewart	Saint Cloud, Minn.
William B. Stewart, <i>l</i>	Waynesburg, Pa.
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William Melville Strachan, A.B.	Cleveland, O.
William Suhr	Lincoln, Nebr.
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Claude Roy Tharpe, B.S., <i>Greer College</i>	Bessemer
Bradley Morris Thomas, A.B., <i>Colorado College, l</i>	
Donald Murl Thomson	Tidioute, Pa.
Harry Ellison Thurston, Ph.B., <i>Denison University</i>	Santa Fe, N. Mex.
Franklin Dietrich Tonne	Columbus, O.
Fernin Sarmiento Torralba	Fairmount, Minn.
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Patrick Henry Walsh	New Orleans, La.
Thomas Edward Webber, Jr., A.B., <i>Central University of Kentucky</i>	Cedar Springs
Euril Francis Wharton	Texarkana, Ark.
Walter Quincy Wilgus	Duluth, Minn.
James Burt Wilson, A.B., <i>University of Pittsburg</i>	Ann Arbor
James Parker Wilson	Pittsburg, Pa.
Otto Giles Wismer	Dickson City, Pa.
Earl Salisbury Wolaver, A.B., <i>l</i>	Bay City
William Christopher Wood	Owosso
Edgar Monroe Wright, <i>l</i>	Alameda, Cal.
Frank Arthur Wright, <i>l</i>	Logan, Utah
Fred B. Wright	Lewiston, Mont.
Murray S. Wright	Minneapolis, Minn.
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Hessel Edward Yntema, A.B., <i>Hope College, A.M., g</i>	Memphis, Tenn.
Guy Barco Zewadski	Holland
	Ocala, Fla.

SCHOOL OF PHARMACY

NAME	RESIDENCE
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Lynn Stanford Blake	Coloma
Frederick Thomas Bradt, B.S., <i>Kalamazoo College, p</i>	Kalamazoo

Huang, Chen, B.S., <i>University of Illinois</i>	<i>Kwong Chow, China</i>
Otis Willard Freeman, A.B., <i>Albion College</i> , M.S.	
Edward Dalzell Gibson, <i>p</i>	<i>Buenos Aires, Argentina</i>
William Francis Gidley, Ph.C., B.S. (Phar.)	<i>Holly</i>
	<i>Holly</i>
Ambrosio Aurchio Grillo, <i>p</i>	<i>Santiago, Cuba</i>
Albert Miller Hubbard, <i>p</i>	<i>Ann Arbor</i>
Archie William Hyde	<i>Malone, N. Y.</i>
Bing Yuwen Lin, <i>a</i>	<i>Kwang-tung, China</i>
Margie Lucile Rennie, <i>a</i>	<i>Ann Arbor</i>
Alice Amy Rumsey, <i>a</i>	<i>Ann Arbor</i>
Emil Schragenheim, B.S.	<i>Toledo, O.</i>
Milton John Seeley, Ph.G.	<i>Manton</i>

GRADUATE DEPARTMENT

NAME	RESIDENCE
Alida Alexander, B.S., <i>Michigan Agricultural College</i> , <i>g</i>	<i>Devil's Lake</i>
Botany, Zoology, Geology.	
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Germanic Philology, German Literature, Philosophy.	
Lucy Ella Babcock, Ph.B., <i>Syracuse University</i> , Teacher	<i>LaGrange, Ill.</i>
Zoology.	
Horace Burrington Baker, B.S.	<i>Ann Arbor</i>
Zoology, Zoogeography, Historical Geology.	
Lena Amelia Barber, B.S., <i>Adrian College</i> ; A.B., M.S., Teacher, <i>sp</i>	<i>Columbia, Mo.</i>
A. Lincoln Barker, A.B., <i>Olivet College</i> , Principal of High School	<i>Marshfield, Ore.</i>
Sociology.	
Henry Jewell Bassett, A.B., <i>Maryville College</i> ; A.B., <i>Princeton University</i> ; A.M., <i>Maryville College</i>	<i>Maryville, Tenn.</i>
Classical Languages.	
Iring Miles Bassett, A.B.	<i>Coldwater</i>
German.	
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- Leroy Melville Coffin, B.S., *University of Maine, g* *Los Angeles, Cal.*
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- Edward LeRoy Cole, A.B., *g* *Jackson*
 Education.
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- Edwin Butterworth Mains, A.B., *sp, g* Coldwater
- Eva Grace Miller, A.B., *University of Colorado, Graduate Student at the University of Colorado* Boulder, Colo.
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- Mono Mitobe, A.B., *sp, g* Tokyo, Japan
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English.
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General Linguistics.

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M.S., *University of Illinois*, Instructor of Mathematics in
Agricultural and Mechanical College of Texas Eudora, Miss.
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Botany.
- Margaretta Packer, A.B. Newtown, Pa.
Botany, Zoology, Botany.
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Gertrude Ain Peet, A.B., g Ypsilanti
Ray Cole Pellett, A.B. *Central College* Huntington, Ind.
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- James Owen Perrine, A.B., *State University of Iowa* Ann Arbor
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History, Political Science, Education.
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German.
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English.
- William Allen Robinson, A.B., *Albion College* Lansing
English.
- Robert Spencer Rockwood, B.S., *Denison University*, Instructor
in *John B. Stetson University* DeLand, Fla.
Physics, Electrical Engineering, Chemistry.
- Lee Vincent Romig, A.B., Teacher Claremore, Okla.
Physics. Mathematics, Education.
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ant in *Biology at Vassar College* Ward, Colo.
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Rhetoric.
- Marjorie Harriet Sebring, A.B. Manistee
Rhetoric.
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structor in *Vassar College*, sp Fall River, Mass.
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Zoology.
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Ann Arbor
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 Schoolcraft
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structor in State University of Kentucky
Lexington, Ky.

Eva Grace Miller, A.B., *University of Colorado, Graduate Stu-*
dent at the University of Colorado
Boulder, Colo.

Jessie M. Ostrander, A.B.
 Margaretta Packer, A.B.
Kalamasoo
Newtown, Pa.

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ant in Biology at Vassar College
Ward, Colo.

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Student at University of Illinois
Hope, Ind.
Grand Island, Nebr.

Blair Taylor, *Student in Lakewood Home School, a*
Indianapolis, Ind.

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 Alvalyn Eunice Woodward, Ph.B., M.S., *University of Roches-*
ter, g
Yellow Springs, O.
Rochester, N. Y.

EMBALMING AND SANITARY SCIENCE

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 George Mumaw Ferguson
 Chester Alexander Gilbert
Milford
Scottsdale, Pa.
Woonsocket, R. I.

Summary of Students*

DEPARTMENT OF LITERATURE, SCIENCE, AND THE ARTS

Undergraduates 2614—2614

DEPARTMENTS OF ENGINEERING AND ARCHITECTURE

Department of Engineering 1332

Department of Architecture 123—1455

DEPARTMENT OF MEDICINE AND SURGERY

Resident Practitioners 6

Fourth Year Students 39

Third Year Students 52

Second Year Students 85

First Year Students 106— 288

DEPARTMENT OF LAW

Third Year Students 218

Second Year Students 125

First Year Students 212

Special Students 24

Students primarily enrolled in other Departments 33— 612

SCHOOL OF PHARMACY

Undergraduates 107— 107

HOMOEOPATHIC MEDICAL COLLEGE

Resident Practitioner 1

Fourth Year Students 25

Third Year Students 18

Second Year Students 12

First Year Students 18

Unclassified 4— 78

* Throughout the summaries, in totalling, deductions have been made for names appearing twice in the items added.

COLLEGE OF DENTAL SURGERY

Third Year Students	76
Second Year Students	97
First Year Students	113— 286

GRADUATE DEPARTMENT

Resident Graduates	269
Non-Resident Graduates	8
Completed Undergraduate Course in February, 1914.....	12
Admitted to Undergraduate Studies in February, 1914....	9— 298
Net Total, exclusive of Summer Session.....	5520

SUMMER SESSION OF 1913

Department of Literature, Science, and the Arts.....	629
Department of Engineering	297
Department of Medicine and Surgery.....	130
Department of Law	195
School of Pharmacy	15
Graduate Department	180—1403
Grand Total (net)	6258

TOTAL, INCLUDING THE SUMMER SESSION, AFTER DEDUCTING FOR NAMES COUNTED TWICE

Department of Literature, Science, and the Arts.....	3053
Departments of Engineering and Architecture.....	1528
Department of Medicine and Surgery	386
Department of Law	709
School of Pharmacy	119
Homœopathic Medical College	78
College of Dental Surgery	286
Graduate Department	428

SUMMARY BY STATES AND BY DEPARTMENTS

	Lit., Sci. and Arts.	Eng. and Arch.	Med. and Surg.	Law.	Pharmacy.	Homoeopathic.	Dental	Graduate.	Summer Session.	Total.
Michigan	1572	823	139	197	55	35	166	185	678	3385
Ohio	184	106	23	58	12	10	23	21	123	485
New York	153	133	22	12	10	9	30	13	67	405
Illinois	140	50	8	64	5	3	1	4	54	297
Pennsylvania	101	44	13	42	3	3	10	8	83	269
Indiana	90	29	8	38	5	3	7	8	41	200
Iowa	32	9	3	20	1	3	3	2	14	74
Missouri	18	6	2	24	1	—	—	2	26	70
Minnesota	27	5	3	11	—	1	1	3	15	60
Kentucky	15	8	3	15	—	1	—	—	16	49
Wisconsin	16	8	2	8	—	—	1	4	11	45
Colorado	15	14	—	10	3	—	1	1	7	44
Montana	11	9	—	15	—	—	2	2	7	43
District of Columbia	10	21	1	4	—	—	—	4	7	41
Kansas	16	4	3	7	1	2	—	2	9	39
Nebraska	7	4	4	10	1	—	1	2	12	37
Washington	12	9	6	9	—	—	2	—	8	37
Massachusetts	7	18	3	—	—	—	1	5	6	36
New Jersey	15	12	2	1	1	—	—	1	10	36
California	10	6	3	7	—	1	1	5	7	33
South Dakota	14	3	—	8	—	—	3	2	2	32
Connecticut	11	7	1	2	1	—	1	1	3	25
West Virginia	8	4	2	2	—	1	1	2	8	25
Oklahoma	10	2	—	4	—	1	—	—	10	24
Georgia	1	2	9	1	—	—	1	3	9	23
Oregon	7	2	3	5	—	—	1	—	3	19
Texas	3	5	1	2	—	—	—	1	9	18
Philippine Islands	10	2	2	3	—	—	—	—	4	16
Porto Rico	—	9	2	—	2	—	—	—	5	13
Virginia	2	2	—	2	—	—	1	1	7	13
Wyoming	2	5	—	3	2	—	—	—	3	13
Louisiana	2	2	—	2	—	—	—	—	7	12
Mississippi	2	3	—	1	—	—	—	—	7	12
Tennessee	4	—	2	—	—	—	—	1	6	12
Arkansas	2	2	—	3	—	—	—	1	4	11
Maine	4	5	—	—	—	—	—	1	1	11
Utah	5	2	—	4	—	—	—	—	1	11
Florida	5	2	—	1	—	—	—	1	4	10
Arizona	5	2	—	1	—	—	1	1	1	9
Maryland	2	4	—	—	—	2	—	—	3	9
Idaho	6	—	2	2	—	—	—	—	3	8
Rhode Island	1	2	—	2	—	—	1	—	2	8
Vermont	6	—	1	—	—	—	—	—	2	8
Alabama	1	1	1	1	1	—	—	—	5	7
Hawaii	2	1	—	—	—	—	—	—	4	6
New Hampshire	1	3	1	—	—	—	—	—	1	6
New Mexico	2	1	—	2	—	—	—	—	2	6

Summary of Students

671

	Lit., Sci. and Arts.	Eng. and Arch.	Med. and Surg.	Law.	Pharmacy.	Homoeopathic.	Dental	Graduate.	Summer Session.	Total.
South Carolina	1	1	1	2	1	—	—	—	1	6
Nevada	1	2	—	2	—	—	—	—	1	5
North Dakota	3	—	—	—	—	—	—	1	2	5
North Carolina	1	—	1	1	—	—	—	—	1	3
Delaware	1	—	—	—	—	—	—	—	—	1
China	21	28	3	3	—	—	—	4	50	79
Ontario	9	10	—	1	—	1	6	1	3	28
South Africa	—	—	—	—	—	—	10	—	3	10
Japan	2	2	—	—	—	—	—	2	4	8
India	—	1	3	—	—	—	2	1	1	7
Turkey	—	3	1	—	—	—	2	—	—	6
Argentina	2	—	—	—	1	—	—	—	3	5
Germany	2	1	—	—	—	1	1	—	2	5
Colombia	—	1	2	—	—	—	—	—	3	4
Mexico	—	1	1	—	—	—	—	—	3	4
Poland	—	2	—	—	—	—	—	1	—	3
Brazil	—	—	—	—	—	—	—	—	2	2
Chili	—	2	—	—	—	—	—	—	1	2
Cuba	—	1	—	—	1	—	—	—	1	2
England	—	—	—	—	—	—	1	1	1	2
West Indies	1	—	—	—	—	—	1	—	1	2
Armenia	—	1	—	—	—	—	—	—	—	1
Austria	—	1	—	—	—	—	—	—	—	1
British Columbia	—	—	1	—	—	—	—	—	—	1
Bulgaria	—	1	—	—	—	—	—	—	—	1
Ecuador	—	1	—	—	—	—	—	—	—	1
Egypt	—	—	—	—	—	—	1	—	—	1
Greece	—	1	—	—	—	—	—	—	—	1
Holland	—	—	—	—	—	—	1	—	—	1
Manitoba	—	1	—	—	—	—	—	—	—	1
Nova Scotia	—	—	—	—	—	1	—	—	—	1
Persia	—	1	—	—	—	—	—	—	—	1
Peru	—	1	—	—	—	—	—	—	—	1
Quebec	—	—	—	—	—	—	—	—	1	1
Russia	—	1	—	—	—	—	—	—	1	1
Scotland	1	—	—	—	—	—	—	—	—	1
South Australia	—	—	—	—	—	—	1	—	—	1
Uruguay	—	—	—	—	—	—	—	—	1	1
Total	2614	1455	288	612	107	78	286	298	1403	6258

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